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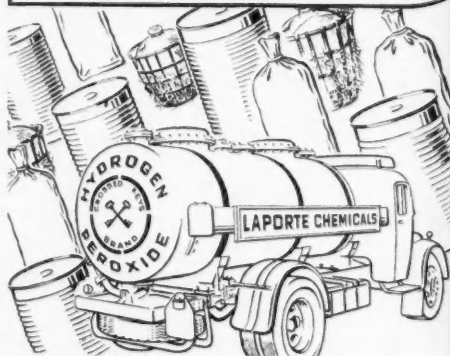
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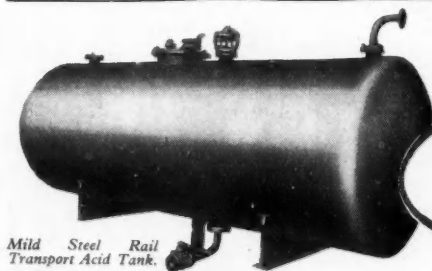
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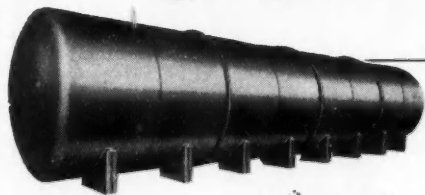


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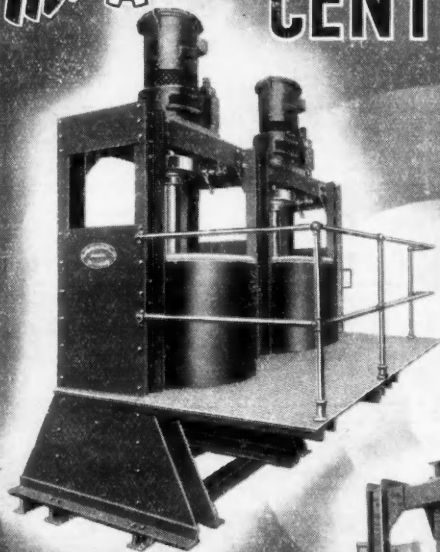
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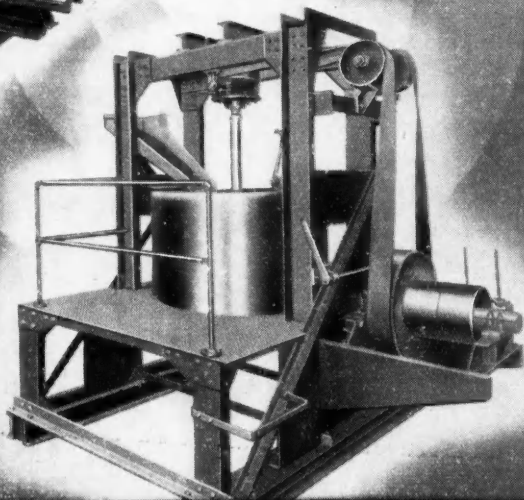


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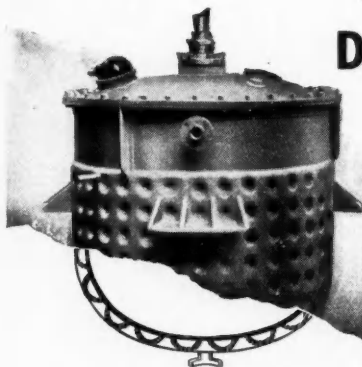
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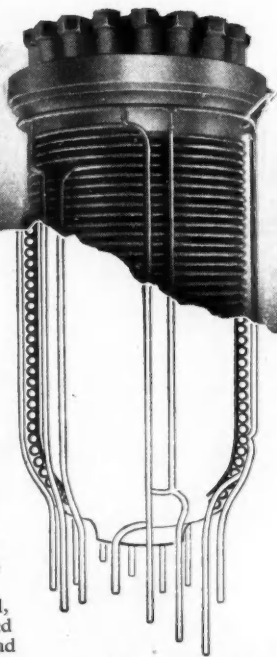


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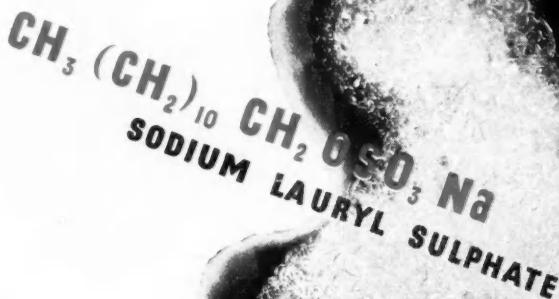
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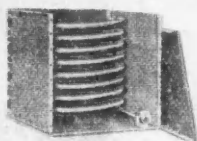
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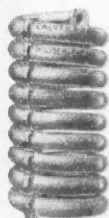
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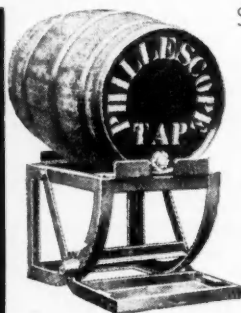
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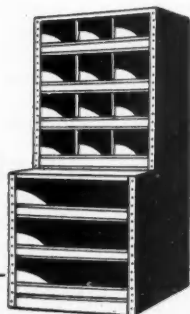
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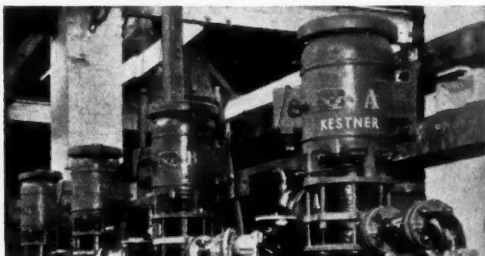
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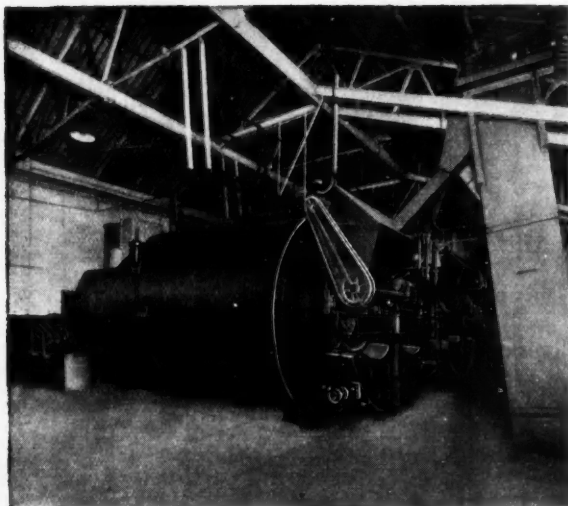
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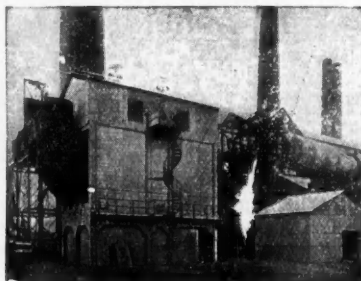
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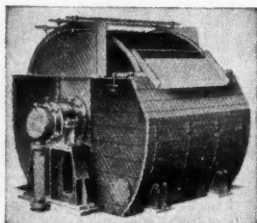
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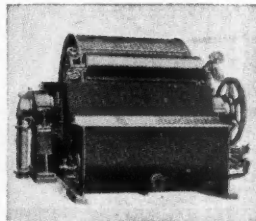
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Volume LXII

1 April 1950

Number 1603

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## Petroleum Detergents

**W**HENEVER reference is made to the enterprises which are widening the field of chemical processes in this country the growing effectiveness of the relatively young industries based on petroleum derivatives is usually the factor which comes most readily to mind. They represent, in fact, very much less than half the tale of new chemical products in the U.K. which had no real counterpart in the years before the war; but, because of the essential character of the materials they are producing and of the very much larger range they promise to yield, the subsidiary enterprises linked with the new programme of petroleum refining are recognised to be potent factors in the future of industries.

One of the outstanding characteristics of the growing ability to procure essential materials and some new ones by the petroleum route is the change which is being wrought in traditional activities. The "synthetic" detergents based on petroleum derivatives are at the moment perhaps the most obvious example. Their adoption in the domestic sphere has been more rapid than could have been foreseen and the extent of their acceptance has fairly certainly not yet reached the limit. In industries, however, these new surface active agents were tested,

and in many quarters accepted, before they were presented to the domestic market. In the degreasing of metals, in wool washing, dyeing and other textile processes the new materials are affording possibilities of effective detergency under difficult conditions which made it quite certain that they have come to stay.

For practical purposes, the petroleum detergents can be classed as the alkyl sulphates and the alkyl aryl sulphonates, although these by no means exhaust the possibilities of producing materials which dispense with the need for soap in a fairly wide field of uses. Emphasis seems to rest at the present upon the alkyl sulphate form, although development here and in America, the home of petroleum industries, has shown that the alkyl aryl sulphonates can be no less effective. They represent the largest proportion produced in the U.S.A. From the user's point of view, the differences between the two are not significant. Both have the marked advantages of not forming a precipitate in the presence of the salts occurring in greater or less degree in untreated water and show an equal indifference to acid solutions and some of the metals which precipitate fat soaps.

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These are among the very significant facts which some time ago were assembled in much fuller form by A. Lawrence Waddams (chemist of Shell Chemicals, Ltd.), largely in response to objections which had been raised to the spreading use of synthetic detergents. That complaint is not a novelty, and last week there was raised again substantially the same case as was first advanced soon after synthetic detergents came into fairly general use in the centres of woollen and textile industry. The sewage authority of Bradford is claiming that some sewage disposal filters are becoming ineffective and the recovery of wool grease, which contributes a substantial return to the Bradford civic budget, is becoming increasingly difficult. These things, in their view, require that much more restraint must be exercised in the use of synthetic detergents, which they identify, without very much conclusive evidence, as the primary cause of whatever aberrations are found in the specialised costly plant which Bradford installed, with special capacity for fat recovery.

This further piece of "evidence" in the case which is being built up in various parts of the country for closer

statutory regulation of industrial effluents is peculiar to Bradford and the one or two other centres where textiles are the basic industry, and the critics admit that their objections have more to do with what might happen in the future, if the use of synthetic detergents continues to spread at the present rate, than with the present. It is not difficult to show on the evidence of laboratory tests that large-scale injections of an alkyl sulphate in a sewage sample will render inoperative the acid cracking process employed in the grease-recovering centres. What has not been established, and most probably never will be, is that such a concentration of chemical detergent will be reached at some future stage in the sewers, even of Bradford or Huddersfield, where their obvious advantages in wool processes have gained for these detergents wider acceptance than anywhere else.

One aspect in which a chemical addition to sewage, even in trace amounts, may have disrupting effects on disposal plant is the capacity to destroy anaerobic bacteria. Investigations so far have shown the alkyl sulphates are more or less innocuous to the principal

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## Notes and Comments

### Bulk Buying Doctrine

SOME of the reasons for the heat engendered by the repercussions in the House of Commons of the Minister of Health's dispute with British suppliers of laboratory ware are becoming clear. The association, whose members, it now appears, would have supplied for the same or a smaller sum the beakers and flasks required for the hospitals, which Mr. A. Bevan procured, with undisguised satisfaction, from German suppliers, has wisely put on record the facts in its possession about this unnecessary *fracas*. It seems clear that the suppliers were not responsible for it (page 459 in this issue). The British Chemical Ware Manufacturers' Association says this: "Readers of Mr. Bevan's statement and answers would no doubt get the impression that a group of manufacturers were conspiring together to rob the public. What was really happening was that the Ministry of Health was striving to break down a carefully built up system of economical distribution of laboratory glassware and other similar goods—in order to bolster up the Ministry's own case for bulk buying."

### No Conspiracy

THE association emphatically refutes the suggestion that there is anything in the nature of a monopoly or price ring. Their common interests are to resist foreign competition and "black-market operations." The Ministry of Health evidently is unprepared to admit that distribution of such things as laboratory glassware is an essential and specialised job. The Ministry has in fact set up six stores to serve as distribution centres of hospital equipment and is stated to have claimed for them discounts which the laboratory furnishers earn by their expertness in a highly complicated service. The wisdom of attempting to dispense with the experts is doubtful. The unwisdom of Mr. Bevan's disingenuous evasion of the fact that retail

laboratory furnishers were never asked to quote for the order—on which he saved "10 to 30 per cent" in Germany—is not doubtful at all.

### Chemical Textiles

IMPRESSIVE evidence of the vigour and resilience of one of the characteristically modern groupings of chemical industry, that linked with synthetic filaments and their textile products, has been presented with much candour—enlivened with illustrations and decorative embellishments which would seem very strange in a British company report—by the Celanese Corporation of America. Its unconventionality by British standards does not lessen the capacity of the American report of 1949 to inspire confidence, even though it has to record the sharp adverse wave which swept over American textile industry in the early part of last year. There was here no parallel with the curtailment of textile buying, which in America reached its peak just 12 months ago and was the chief factor in reducing Celanese Corporation's profits to \$20.6 million. Such earnings still sound prodigious, except in comparison with 1948's \$38.8 million. Elsewhere, that east wind over American textile industry must have produced very much more disconcerting results. Chemical yarns, as this report makes clear, suffer scarcely any of the violent price fluctuations characteristic of the wool and cotton markets and are immensely more responsive to changing demand. The need for such adaptation may be gauged by the scale of the reduction of the American corporation's sales in the year by \$59 million to \$171 million. Expenditure on new plant was cut to about one-fifth of the \$41 million employed in 1948, but the momentum of the original programme will continue to enlarge American production of cellulose acetate yarns, fibres and plastics, and the family of essential associated chemicals.

(continued overleaf)



### Finance and Fertilisers

**T**HE Government decision to continue a fairly substantial measure of assistance to encourage use of artificial fertilisers has averted what might have been a serious setback, to an important branch of chemical industry as well as to the agricultural community. While the grants from July 1 of one-third of the cost of fertilisers used on marginal grassland and two-thirds in respect of old grassland put under plough will not entirely recompense the first overall cut in fertiliser subsidies, fertiliser manufacturers believe that this and the improvements in some farm produce prices announced last week will prevent serious cuts in fertiliser usage. The situation, although far from ideal, might have been a great deal worse. The situation foreshadowed by the early proposal, to remove all fertiliser subsidies by July 1951, adding approximately 50 per cent to farmers' payments, would have operated very adversely upon the growth of two key industries, food production and the manufacture of fertilisers. That possibility fortunately does not appear to have deterred the principal makers of fertilisers from planning to increase capacity on a handsome scale. Fison's confidence in widened demand was attested by the news several weeks ago of the intention to spend more than £5 million to enlarge production of sulphuric acid, superphosphate and compound fertilisers and initiate the production of triple superphosphate. The cordial acceptance of the £3.5 million offer of shares, which had the good fortune to coincide with the news from the Agriculture Ministry, commends that enterprise.

### Co-operation in Safety Measures

**A** PRAISEWORTHY impartiality in a good cause appears to have animated the publication in the chemical trades union journal of an uncompromising presentation by a safety officer of the shortcomings of most trades unionists in reducing the element of risk in chemical works processes. The principle which underlies the proposals made in this article

(*The Chemical Worker*, 31, No. 3, 12) is the somewhat rare one of doing something for the good of the industry instead of or the interests of a section. Safety is everybody's business and certainly transcends wage packets and paid holidays or dividend warrants in ultimate importance. The writer says that, in his experience as an industrial safety officer, he has found unions more interested in securing damages for their members who have become accident cases than in doing what might have helped to prevent the accidents. He asks why the trades unionists do not also take some of the blame for allowing accidents to happen "because of their 'do-nothing' attitude." Seldom, he alleges, do representatives of the trade unions attend any of the safety meetings. W. J. S. suggests a number of ways in which the trades unions might help make the accident rate even smaller. He pertinently asks how often is "safety" discussed at branch meetings, and how much space is given to "safety" in the union's publications.

### PETROLEUM DETERGENTS

(continued from page 456)

digesting bacteria, even in substantially larger concentrations than have been recorded in sewage.

Over the rest of the U.K. the chemical substitutes which are helping to ease the shortfall in domestic soap supplies (estimated to represent approximately the difference between 450,000 and 300,000 tons a year) are going into household use, widely but in small quantities, and to the laundries. For many purposes, no synthetic yet produced shows any promise of being a complete substitute for normal soap, but in their present popular uses no diminution is in the least likely, even should there be a substantial easing of the world need to reserve many fats for food rather than for soap. Against that remote prospect is contrasted the certainty that within a few years the U.K. will have the largest assembly of petroleum and related industries in Western Europe.



## GLASSWARE FROM GERMANY

### "Saving of 10-30 Per Cent"

QUESTIONS regarding the purchase of glassware from Germany for supply to hospitals were again asked in the House of Commons last week. Further information on the terms of the German contract and conditions prevailing here was sought by Mr. John Grimston, Sir H. Williams and Mr. E. H. Keeling.

Mr. Aneurin Bevan replied that he understood that an agreement between manufacturers and distributors of furnace-blown and pressed laboratory glass precluded manufacturers from tendering for Government bulk requirements of beakers, flasks and heavy chemical glassware. Total hospital needs were estimated at £15,000 a year, of which one-third could be obtained under direct contract with manufacturers. The landed duty-paid value of glassware recently imported from Germany was £2765, the rate of duty being 33 per cent. The purchase represented a saving varying between 10 and 30 per cent compared with prices for the same size and types of British glassware.

### Dollar Aid Alleged

In answer to a further question from Mr. R. V. Grimston who stated that there was "a dollar component" in the German goods, the Minister of Health disagreed and said that the reason for going to Germany was that in the U.K. retailers alone were allowed to tender. That was why the saving had been made. British manufacturers had, however, been asked to tender again, and he hoped "their future conduct would be better."

Mr. E. H. Keeling asked the Minister if he was aware that his statement that retailers had been asked to tender was wrong? They were not asked. The questioner recalled that, by buying from Germany, the Ministry had gone against the advice of a Government committee, which had said that laboratory glassware was a key industry which should be maintained in this country at all hazards.

Mr. Bevan said that if the industry was so necessary for the welfare of Britain, that situation ought not to be exploited by the industry itself. Replying to a further question from Mr. Emrys Roberts, whether the arrangement between the glass manufacturers and retailers should be referred to the Monopolies and Restrictive Practices Commission, the Minister of Health said he had the matter under consideration. (Comment: page 457)

## SUPPLIERS REPLY

### "No Glassware Tender Invited"

THE Minister of Health's omission to answer in the House of Commons the question whether retailers were in fact invited to tender for the glassware required by the Ministry for hospitals is one of the matters on which revealing comment has been made by the British Chemical Ware Manufacturers' Association. "The fact is that no retailer was asked to tender," observed the association in a statement this week to THE CHEMICAL AGE. "If they had been invited it is probable that they would have quoted prices very near the imported duty-paid value mentioned in the House."

"The present dispute is a year old. In February 1949 the Ministry of Health issued a tender for a variety of laboratory glassware. The manufacturers asked the Ministry to obtain tenders from their authorised distributors. The Ministry refused to do so.

### German Imports Threat

"A meeting was called at which distributors were invited to state their case. At this meeting Ministry of Health and Ministry of Supply officials were present, but the Ministry of Health deliberately prevented the manufacturers from being invited to attend. In July the Ministry issued a further tender for beakers and flasks only and they called a meeting of the manufacturers only and tried to persuade them to disown the laboratory furnishers. They threatened to import from Germany unless the manufacturers agreed to their proposals and they said they could accept no compromise whatsoever. The manufacturers submitted a complete statement of their case on August 22, 1949 and sent a letter promising adequate supplies of glassware and quantity discounts if the Ministry would invite their distributors to tender. They promised priority to compensate for the delay caused by the dispute."

"On January 31, 1950 the Ministry of Supply, who are responsible for sponsoring the scientific industries in this country, called a meeting of manufacturers, distributors and officials of the Ministry of Health. At this meeting all parties agreed to a compromise whereby the Ministry of Health would invite the laboratory furnishers to tender and the manufacturers and furnishers agreed to do everything possible to facilitate supplies of beakers and flasks at prices in keeping with the quantities required." (This invitation, as stated, did not materialise.)

## Iodisation of Edible Salt

### Ministry Backs Medical Recommendations

THE addition of iodine to salt as a prevention of goitre has been recommended in the report of the Medical Research Council. The council, noting the increasing incidence of the disease, urged that preventive action should be taken on a national scale by the addition of a trace of iodine to salt used for domestic purposes.

The procedure recommended is the addition of either one part of potassium iodide to 100,000 parts of all salt (NaCl), or one part to 40,000 parts of packeted table salt.

This recommendation has been supported by the Ministry of Health Standing Committee on Medical and Nutritional Problems, and the Food Standard Committee has been asked to advise what measures would require to be taken. Data are required on the form in which the standard of composition should be expressed, the practicability of enforcement by chemical analysis, and whether special labelling provisions should apply to iodised salt.

#### Technical Problems

In 1948, production of salt for use in the home (35 per cent of total production for food purposes) consisted of prepacked free-running salt 65,000 tons; packeted household cooking salt 30,000 tons; and cut lump salt 24,700 tons.

Prepacked salt includes stoved vacuum salt, ground open-pan salt and bar salt (repacked in small pieces as "cut lump"). The addition of iodide to stoved vacuum salt and ground open-pan salt presents no difficulty, but it is technically impossible to iodise bar salt. Prohibition of the sale of all prepacked salt, unless iodised, would, therefore, bring to an end the retail sale of "cut-lump" salt.

At the present time only 1.6 per cent of the current output of prepacked salt is iodised. Since the requisite machinery exists, it is officially estimated that within a year from the issue of an order, manufacturers could iodise prepacked salt sold as "free-running" table salt, and packeted household cooking salt within two years.

The amount of potassium or sodium iodide to be added would be not less than 15 and not more than 30 parts of iodine per 1 million parts of salt. To minimise loss of iodine, iodised salt would have to be packed in moisture-resistant containers. Iodised salt would require to be labelled as such and date stamped.

Three main methods of incorporating the

iodide described to the Ministry committee were these:—

- (i) Spraying the salt with a solution of iodide in a mixer, followed by drying.
- (ii) Spraying the salt on a moving belt system, followed by drying.
- (iii) Dry-mixing. The iodide mixed with about 100 times its weight of salt is then added to the bulk of the salt.

It was suggested by the trade representatives that the prescription of a standard method of incorporation of the iodide might be considered.

The committee was satisfied that chemical analysis could be relied upon for the enforcement of the standard required.

The report has thus given support to the second alternative of the recommendations of the Medical Research Council—namely, the iodising of salt for table use, instead of iodising all salt.

Consideration was given to a criticism that the universal use of iodised salt might be deleterious to some persons is taken habitually over a long period, and it was concluded that the risk was negligible.

#### Few Casualties in Chemical Works

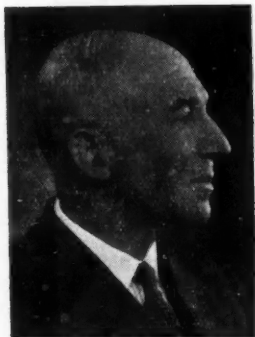
NUMBERS of deaths from industrial accidents in the United Kingdom in December 1949 were 134, against 163 in the same month of the previous year. The current year also started with an improvement, the total for January being 108 compared with 119 in January 1949. Fatalities in chemicals, oils and soaps were especially low, one death having occurred in December and five in January.

During the same two months there was only one death reported under the Factories Act, 1927, or under the Lead Paint (Protection Against Poisoning) Act, 1926. This was in December and was due to lead poisoning.

Cases of industrial diseases reported in December totalled 42 and in January 45. The latter were comprised as follows:—  
January: Lead poisoning, four; other poisoning, five (mercurial poisoning, one; compressed air illness, four); anthrax, four; epitheliomatous ulceration, eight (pitch, six; tar, one; oil, one); chrome ulceration, 24 (manufacture of bichromates, one; chromium plating, 21; other industries, two).

## "A UNITED CHEMICAL PROFESSION"

### Aim of the British Association of Chemists



Dr. Herbert Levinstein

**T**HE general theme of the speeches after the annual dinner of the British Association of Chemists, in London on March 24, was the desirability of a united chemical profession.

Proposing the toast of "The Ladies and Our Guests," Dr. Herbert Levinstein said they had with them a sort of "royal flush" of presidents, of the Royal Society, the Chemical Society, the Royal Institute of Chemistry, the Society of Chemical Industry, and the Institution of Chemical Engineers. Their presence testified to the good fortune of the BAC, a trade union, in having the support of the leaders of the professional societies.

Since its inception, some 30 years ago, the association had consistently served one objective, the welfare of the chemical profession. He believed they had rather more than 2500 members to-day. He would not be satisfied until they had 7500.

#### A Trade Union

His predecessor in the association's presidential chair, after the 1914-18 war, performed the difficult task of making the BAC a trade union, a non-political one. A union of people engaged in a technical work, they were not affiliated to the TUC and were proud of their standing. About 20 per cent of their members were directors of large and small companies in the chemical industry, and all were qualified chemists.

One of the important activities of the BAC was looking after the salary of its

members, especially of their young chemists, and securing for them proper remuneration for patents. The BAC made no distinction, however, between those who were employed and those who gave employment. They were in that respect the equivalent of the old guilds. He considered they had great opportunity of uniting all those who were engaged with them, technically or scientifically, as a sort of guild of chemists, whether by affiliation with the Royal Institute of Chemists and other bodies or other means.

Sir Robert Robinson, responding to the toast, acknowledged the good work Dr. Levinstein had done for chemistry and for chemists. Recalling that most of those present were guests and therefore not members of the BAC, he declared that responsibility for that situation rested with the association. He had received from the BAC one introductory letter and nothing else. "Why do you leave out people like us?" asked Sir Robert Robinson. "I think your propaganda is bad." He personally was a member of a lot of other associations of chemists, but not of the British Association of Chemists.

#### More Vigour

As regarded the BAC having no political influence or connections, he thought it should be a body with considerable political influence. "I think, for example," he said, "that it is time we started to look for our own 'radio chemist'."

Sir Ian Heilbron, also responding to the toast, said he could claim a very long association with the BAC. Twenty-five years ago he had preached the necessity of a union of chemists, to be a counterpart in chemistry of the BMA. "If we are to have unity in the world," he added, "then for Heaven's sake let the scientists give a lead and let us have a real union of chemists." He gave an assurance he would do everything he could to further the interests of the association and he supported Dr. Levinstein's view that such a trade union could be like one of the old guilds, admitting to membership all qualified members of any particular trade or profession.

He wished every prosperity to the steps which the BAC was now taking to increase its membership, by working along parallel lines with such bodies as the

(continued at foot of next page)

## Expansion of Dutch Chemical Industries

### Additional Finance Sought for Superphosphates

**A** REVIEW of chemical industry in Holland estimates that \$575 million will be needed to finance planned investments for the expansion and modernisation of the industry until 1953. The authority for that estimate is the Dutch Rehabilitation Bank.

Some chemical manufacturing companies, this report observes, are now able to produce considerably more than the home market can consume. The general chemicals production index (1938 = 100) was 98 in the first quarter of 1948 and 110 in the same period of 1949. In the last quarter of 1949 it increased to 118.

No reference is made in the report to certain large factories which are being rebuilt or otherwise modernised, nor to the highly important petroleum industry. The latter would have no need of external aid.

Mention is made, however, of the chemical expansion at the State Mines, the rehabilitation of the nitrogen undertaking of Sluiskil, the completion of the Mekog installations of Ijmuiden and the important Caltex petroleum refinery at Rotterdam.

The Albatros Superphosphate Factories which operates the superphosphate plants of the Amsterdamsche Superfosfaatfabriek and of the Vereenigde Chemische Fabrieken is said to be producing some 400,000 tons annually compared with an average of 300,000 tons just before the war. 170,000 tons of sulphuric acid—an increase of 10 per cent—is supplied by the company's own plant.

As the demand for superphosphate far exceeds the aggregate production of the

four Dutch producers, the Albatros intends to put up another factory, and has appealed to the Amsterdam Stock Exchange for capital.

The N.V. Brocachimie (an affiliate of Brocades Stheeman & Pharmacia) is reported to be increasing the production of para-amino-salicylic acid at Zaandam. The Dutch need of PAS is placed at some 8000 kg. a year.

Although a number of smaller firms are stated to be making good progress, the expectation is that most expansion will in future be in the hands of the major undertakings.

An eventual surplus of nitrogen is expected as a result of recent expansion, which will necessitate an export outlet, but the bank emphasises the fact that the industry's low production costs should greatly contribute in procuring much-needed foreign currencies.

Rapid progress since the war is recorded as being made by the pigment industry, helped by the chemical developments of State Mines. Sales potential is considered high in home and overseas markets.

Mij. tot Exploitatie van Kooksoevengassen has erected a generator for the production of water gas, soon to be used for the synthesis of ammonia. The company is expected to implement its plans this month.

The Royal Dutch Salt Industry, Ltd., records another increase in salt production and salt-derived chemicals during the past year. Salt output in 1949 was 330,000 tons, compared with 249,260 tons in 1948. The transfer of the plant and all activity at Boekelo to Hengelo has been completed.

#### "A UNITED CHEMICAL PROFESSION"

(continued from previous page)

Royal Institute of Chemistry—not in antagonism and each preserving its own ideals.

Professor J. W. Cook, in a brief response, said that in the Royal Institute of Chemistry they had, in many respects, aims and objects in common with the BAC. He supported the view that the time had come for a united chemical profession.

The association's president, Dr. Herbert Levinstein, occupied the chair and was supported by a number of other eminent chemists, including Professor Sir Robert

Robinson (president of the Royal Society), Professor J. W. Cook (president of the Royal Institute of Chemistry), Professor Sir Ian Heilbron (president of the Chemical Society), Professor D. M. Newitt (president of the Institution of Chemical Engineers), Mr. Stanley Robson (president of the Society of Chemical Industry), Dr. L. A. Jordan (director of the Paint Research Station), Dr. T. P. Hughes (chief chemist of the Farnborough Aircraft Research Establishment), Dr. H. J. T. Ellingham (secretary of the Royal Institute of Chemistry), Mr. H. L. Howard (chairman, London section of the BAC).

## ANOTHER U.K. REFINERY

### British-American Collaboration

THE intention to construct at Coryton, in the Thames Estuary, a new oil refinery primarily for the production of lubricating oils from Middle East crude is disclosed in an announcement by the boards of Powell Duffryn, Ltd., and of Socony-Vacuum Oil Company, Inc., New York.

This states that "heads of agreement have been signed" to incorporate the oil storage, blending and packing business carried on at Coryton by Cory Brothers & Co., Ltd., a Powell Duffryn subsidiary, into the business carried on in the United Kingdom by Vacuum Oil Co., Ltd. (a subsidiary of Socony-Vacuum Oil Co., Inc.).

The whole of the Cory property at Coryton is to be acquired by Vacuum and the purchase price will be satisfied by the issue of ordinary shares in Vacuum to Cory Brothers. Further ordinary shares will be subscribed by Powell Duffryn and Socony-Vacuum, the Powell Duffryn share of which will amount to about £3.5 million.

### Equal Control

The board of Vacuum Oil Co., Ltd., will be enlarged to give Powell Duffryn and Socony-Vacuum equal representation. When the existing Coryton business of Cory Brothers & Co., Ltd., has been incorporated into Vacuum Oil Co., Ltd., and the additional shares in Vacuum Oil Company have been issued, the equity share capital of Vacuum Oil Co., Ltd., will be held equally by the Powell Duffryn group and Socony-Vacuum Oil Company.

Approval of Coryton as the location of the new refinery is stated to have been received from the Board of Trade. The Vacuum Oil Company states that it is hoped to start construction this year and finish in 2½ years.

The capital expenditure by Vacuum Oil Company at Coryton and elsewhere will be about £10 million. This will be provided in part by the share subscriptions of Powell Duffryn and Socony-Vacuum. Discussions are in progress with the Finance Corporation for Industry, Ltd., for the provision of the balance by loan. It is not proposed at present to make a public issue.

A report in *The Times*, March 25, states that a Vacuum Oil Company official has affirmed that the maximum of equipment will be manufactured in this country. Some will necessarily come from the United States.

The refinery should have a total throughput of about 750,000 tons a year.

## WIDENED ALKALI ACT

### Carbon Black Not Affected

FOLLOWING the public inquiry in October last year (*THE CHEMICAL AGE*, 61, 587), and after consultation with the local authorities and other interests concerned, a new order has been made entitled the Alkali, etc., Works Order, 1950. This came into operation on March 25, and amends the 1906 Act by making a number of extensions to the manufacturing processes controlled.

The effect of the order is to add volatile organic sulphur compounds and fluorine to the list of noxious or offensive gases, the discharge of which into the atmosphere is controlled; to add fluorine works and acid sludge works to the list of scheduled works liable for registration under the Act; and to extend the range of processes carried out in sulphuric acid works, bisulphite works and cement production works, the operation of which renders the works liable for registration under the Act.

The original draft order, which was published in October last, also proposed to regulate fumes containing carbonaceous particles from black production works, and to impose registration on carbon black works, but it has been decided not to include carbon black in the present order.

## More Price Rises

INCREASES in the controlled price of sulphuric acid taking effect to-day (April 1) have been announced by the Board of Trade. The maximum price of "weak sulphuric acid" (BOV, approximately 77 per cent) is raised by 11s. 6d. per ton and of "strong sulphuric acid" (94-96 per cent) approximately by 14s. 6d. per ton. These increases appear to represent the changes which have been anticipated since the devaluation of the £ sterling rendered much more costly supplies of sulphur from the U.S.A. One representative maximum price of a concentrated grade of sulphuric acid will now be approximately £7 17s. per ton delivered.

### Zinc and Oxide

The domestic price of zinc was raised on March 28 by £2 to £89 10s. a ton, the second increase in two weeks. Zinc oxide prices were increased by £1 15s. per ton for 2-ton lots, delivered, the new levels being £85 15s. (red seal), £87 5s. (green seal), and £88 5s. (white seal).

## SYNTHETIC DETERGENTS

### *Their Effect on Sewage Plants*

THE problem which has been facing the Bradford sewage undertaking at Esholt for some time, of the effect of the increasing use of soap-saving liquids and powders on the efficiency of the works, was referred to by Mr. Stanley Scott, chairman of the Sewage Committee, at a recent meeting of the City Council. He gave a warning that the increasing use of synthetic detergents might prove a menace to the city's health and finances. It might mean the clogging of filters, while the extraction of wool grease would become impossible, which would have a drastic effect on the rates.

#### **Future Risks**

Mr. Scott pointed out that there was no single process for "cracking out" these synthetic detergents from sewage that would be applicable to all the three types if used simultaneously. He had himself seen two six-foot deep filters "black septic" in less than six months after being dosed with synthetic detergent in solution. It was not generally realised what would be the position of the city if such a thing happened to the filters at Esholt.

Mr. W. H. Hillier, sewage works engineer and manager, subsequently emphasised the warning that the extensive use of synthetic detergents would have a more serious effect on Bradford's system of sewage disposal than on most other sewage undertakings in the country. The Bradford works were built round the use of sulphuric acid and the trouble was caused by the fact that these synthetic detergents were not affected by the acid.

#### **Possible Charges**

Other works, such as those at Huddersfield and Halifax, using acid in a different way, were affected to a less degree.

If the "acid cracking" system had to be changed it would involve a huge expenditure, for the process considerably reduced the sewage bulk, and other systems would also mean considerable extensions to the works. Also equally important would be the serious reduction in revenue from the sale of greasy products.

Mr. Hillier stated that the efficiency of two of the main processes was impaired, but they were not yet in serious trouble. They were concerned about the future. He believed, however, that when soap became more freely available the use of synthetic detergents would diminish.

(Comment : page 455)

## SYMPOSIUM FOR STUDENTS

### *Lectures by Prominent Chemists*

SOME 700 secondary and grammar school pupils, boys and girls, formed the audience to which eight prominent scientists gave ten-minute lectures at a symposium at Leeds University on March 24. Promoted by the Leeds area section of the Royal Institute of Chemistry, it was the first conference of its kind to be held in Yorkshire. The students, who came from all parts of the country, were specially chosen by their head teachers because of their interest in chemistry or related subjects.

Professor F. Challenger, vice-president of the RIC, who opened the symposium, said that the whole intention was to assist those who were thinking of making a career in some branch of chemistry.

He referred to the student of science as one whose enthusiasm sometimes led to a lack of balance, and to a forgetfulness of the relation of knowledge and experience to things outside the boundaries of science. He maintained that a wholehearted devotion to the study of science should not be incompatible with the capacity to write and speak good English. No one, said the professor, who had had experience of reading scientific manuscripts would deny that this warning was needed.

#### **Varied Aspects**

In addition to Prof. Challenger, the lecturers and their subjects included Mr. J. W. Baker, reader in organic chemistry at Leeds University ("Training in the University"); Mr. R. L. Elliott, head of the department of chemistry and dyeing at Bradford Technical College ("Technical College Training"); Mr. G. Brearley, managing director of Brotherton & Co., Ltd., Leeds ("Industrial Research"); Mr. J. R. Nicholls, deputy Government chemist; Prof. R. E. Tunbridge, professor of medicine, Leeds University ("Chemistry and Medicine"); Miss Mamie Oliver, research chemist; and Mr. W. A. Wightman, secretary of the Leeds area section of the Royal Institute of Chemistry.

#### **Insecticides and Poisons Act**

IN a written answer to Brigadier Medlicott, asking whether insecticides now being used in relation to agricultural and horticultural produce complied with requirements of the Poisons Act, the Home Secretary, Mr. Chuter Ede, stated that he had no evidence that this was not the case.



## Production and Packaging Efficiency

### Early Co-ordination to Prevent Corrosion Losses

**T**HE paramount importance of using every safeguard against the corrosion of metal parts, during assembly or other stage of production, was emphasised to the Midlands branch of the Institute of Packaging by Mr. J. E. Evan Cook, a specialist in export packaging.\*

It had been calculated (he said) that rust costs the world about £500 million a year. Although everyone was aware of the damage potential of rust, few took the necessary precautions in advance. That absence of forethought was always accompanied by damage.

From the standpoint of the factory management, delay in applying preservative treatment could eventually necessitate throwing the rusted product away as useless, or de-rusting, or other costly renovating process, or "jobbing off" the goods at reduced prices.

The simplest means of countering corrosion was to apply preservative protection. Paint, ideal for certain purposes, was not the universal protective; sometimes the paint needed a preservative coating.

Unpainted surfaces required, of course, rust inhibitors—usually oils or greases containing anti-corrosion compounds. These must, however, be rust-inhibitors. Some oils and greases actually caused corrosion.

Rust often appeared even after very careful preservation treatment. It usually was due to failure to clean before painting. As cleaning and degreasing cost

money, and added to the total cost of production and packing, it was desirable to avoid the need for it. Use of rust-inhibitor oils and compounds instead of the traditional cutting oils and coolants was recommended.

Fingerprints were one of the worst enemies of precision instruments. No component part, sub-assembly or assembled product should go into store until it had been given some form of preservative treatment. This was essential for working parts, or other important, precision parts. Preservatives should also be applied during the assembly of parts which would afterwards be inaccessible or hidden from view.

Too often, in modern factories, the packing department was tucked away somewhere round the corner, looking like an untidy barn. The ideal packing plant was one where cleanliness and order prevailed, where packing was never done on the floor and where the packer was regarded as a skilled operative. Goods and packing materials should never get mixed and should reach the point of packing within arm's reach of the packer.

Great economy was possible by the elimination of unnecessary protrusions. A certain type of machine had eight bolting-down lugs protruding from the base. If bolt holes were incorporated in the base, 4 in. would be taken off each dimension, resulting in a saving of £2000 a year in shipping costs.

It was in production that the cure for many packing ailments could be applied first, and most effectively.

\* "The Place of Packing on the Production Line," by Mr. John E. Evan Cook, joint managing director, Evan Cook's, Packers, Ltd.

## Availability and Uses of the World's Raw Materials

**T**HE importance of world sources of supply of the main materials of industry is recognised in a new series of booklets being issued by the Purchasing Officers' Association.

Although primarily designed to cover the syllabus of the association's final examination subject "Raw Materials (Economic and Geographical Survey)" the series provides useful factual information of interest in a much wider field.

Raw materials of the iron and steel industry are the subject of the first booklet by A. K. Osborne. The principal materials are dealt with, providing in concise form a description of their sources, availability, consumption and a brief out-

line of methods by which they are produced and their main applications.

Some metals, usually regarded as non-ferrous, have been included under the heading "miscellaneous," being considered from the importance of their application as alloying elements in iron and steel manufacture.

Petroleum reserves, production methods, refining, and its consumption, utilisation and transportation are dealt with in booklet No. 2, by George Sell.

The third of the booklets now available is by H. R. Humphries and is concerned with animal feeding stuffs of the concentrated type. It covers cereals (such as maize, oats, barley and non-millable wheat); cereal by-products, etc.

## Fundamentals of Modern Soil Chemistry

### Genesis and Development of Bernard Dyer's Principles

THE comparative novelty of some established principles of soil chemistry and the character of the man who initiated important phases of it were recalled in London recently by Sir John Russell, F.R.S. He was presenting before the Society of Public Analysts and Other Analytical Chemists the first Bernard Dyer Memorial Lecture, commemorating the distinguished analytical chemist whom he knew for some 50 years.

#### Phosphorus and Potassium

One of Dr. Dyer's earliest achievements, said Sir John Russell, was in the determination of available phosphorus and potassium in soil by preliminary extraction with a 1 per cent solution of citric acid. It was the subject of the thesis for which he was awarded his doctorate by the University of London, and of important confirmatory work which he carried out later at Rothamsted. The speaker went on to describe the widening interest in soil chemistry, reflected ultimately by the creation of the Agricultural Research Council.

The processes by which plant roots take up their nutrients from the soil, said Sir John Russell, has been shown to be much more complex than was at first thought; and what is "available" to one plant may not be "available" to another.

The present-day problem was to find analytical methods that would give some measure of the amount of nutrients that crops, under normal conditions, could obtain from the soil.

Dyer's method came into wide but not universal use. Other solvents, in steadily increasing numbers, had been proposed but no two gave the same results.

This problem has been taken up at Rothamsted by J. A. Prescott and the lecturer, who found that when dilute acids act on soils, two reactions proceed simultaneously; the acid dissolves phosphate, but the soil slowly absorbs it from the solution.

This back-action is eliminated by using a diffusion technique, which shows that tenth normal citric, hydrochloric and nitric acids all extracted the same amount of phosphorous; whereas by the ordinary analytical method the citric acid extracts nearly twice as much as the hydrochloric

aid and 50 per cent more than the nitric acid. The citric acid does this because it reduces the difference between the amount extracted by the acid and the amount re-absorbed by the soil.

Only the direct action is wanted by the analyst, the second action upsets his results. So long as he is dealing with similar soils he can assume that the reverse action is also somewhat similar and that his results will still be comparable; but when he is dealing with different soils the reverse action may be different and he may get different analytical results, even though the same amounts of phosphorus have been extracted. Standards applied to one soil cannot necessarily be applied to another.

Modern developments in technique have profoundly changed the whole subject. Citric acid long retained its popularity because it extracted easily weighable amounts of phosphoric oxide and of potassium. This advantage was lost with the use of modern turbidimetric, colorimetric and spectrographic methods, with their ability to deal with amounts too small to be satisfactorily weighed.

These new methods, along with automatic balances and pipettes, have speeded up analytical determinations enormously and vastly increased the number of analyses that can be undertaken.

#### Field Experiments

We have to-day obviously gone a long way from the ideas that formed the background of Dyer's early work. The methods are at present empirical, so that the analyst needs close contact with field experiments to satisfy himself that they are reliable. He has to have a mind sufficiently open to reject them when they ceased to be so, and sufficiently alert to devise others that would be better.

That, however, is no new situation for a consulting chemist. His work lies largely in regions not yet tidied up by the science of the day; his equipment has always to be a wide knowledge of scientific methods combined with ingenuity of invention, soundness of judgment and complete intellectual integrity.

It is because Bernard Dyer possessed these qualities in so marked a degree that they honoured his memory.



# STABILITY OF POWDERS AND EXPLOSIVES

## New Belgian Quantitative Method

IN a brief review of the theory of stability of powders and explosives, R. Leclercq (*L'Industrie Chimique Belge*, 1950, 15 (1), 3-10 (January)) describes a quantitative method of investigation. The author and his co-workers are members of the staff of the Laboratoire du Service d'Inspection des Poudres de Guerre (SIPEG), Zwijndrecht-Fort, Belgium.

Twelve of the many existing methods are noted, including the silvered vessel test, the vacuum test, those of Abel, Vieille, Taliani, Bergmann-Yunk, Hansen, Rouvillois and others, and the relevant literature. These have all been critically examined and the methods are regarded as unsatisfactory in one or other respect.

Before the war, the most reliable method was considered by SIPEG to be that of Vieille—colouring litmus paper—but this cannot be used with some of the new powders, e.g., those containing nitroguanidine up to 50 per cent. Moreover, those containing dinitrotoluene up to several per cent stain litmus paper yellow. Nor was the Abel test with iodised starch paper much better with some of the new powders.

The author notes several earlier papers published in *Mem. Poudres*, *Mem. Art France*, *Zt. f. Ges. Schiess. u. Spreng* (1919-1935). It was decided that a heating temperature of 90°C. was high enough to yield rapid results and low enough to avoid undesirable reactions, and was also suitable for powders whether or not they contained nitroglycerin.

### Humidity Factor

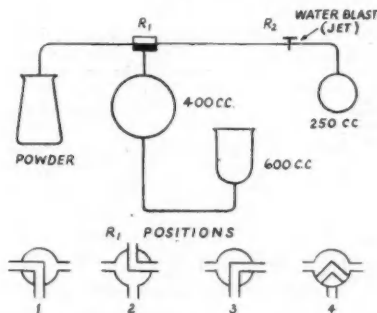
It was desirable also to eliminate the humidity factor, e.g., by establishing in a Regnault atmosphere at 70 per cent, and to secure uniformity in shape by reducing to small cubes or even powder. The amount of NO and NO<sub>2</sub> set free in a given time affords a good measure of decomposition rate. The general aim was to have a sufficiently sensitive determination of the nitrogen oxides to avoid over-heating or prolonged working.

Three samples each of 10 g. after the Regnault treatment were heated to 90°C. during consecutive periods of three hours, and the gas recovered after each heating. For the heating an electric hot cupboard or glycerin-water bath was used, into which the vessels containing sample could be inserted. After recovering the gas these vessels are removed into contact with

outside air for about 45 minutes. The hot chamber was designed after that of Vieille, in which a uniform temperature could be ensured by convection currents (Fig. 1, 2, and 3 in original).

The total NO and NO<sub>2</sub> recovered was determined by the Ilosvay reagent (Patty and Petty, *J. Ind. Hyg. Toxicol.* 1943, 25, 361-5). Conversion of NO to NO<sub>2</sub> was nearly quantitative if, in addition to the prolonged contact with the heated interior for 23 hours, a further contact of 10 min. at ordinary temperature in the vessel containing reagent was made. Analysis was effected either with a colorimeter or spectro-photometer, and NO percentages as function of time were graphed. The reagent was prepared from solutions of naphthylamine and of sulphanilic acid in aqueous glacial acetic acid, and the standard solution was sodium nitrite dissolved in twice-distilled water kept for three months or more.

Extraction is described in connection with Fig. 4 (of original) reproduced here.



The 250 c.c. flask containing the Ilosvay reagent is connected with a water blast through R<sub>2</sub> where a vacuum of about 20 cm. is made, while R<sub>1</sub> is in the first position. Through R<sub>2</sub> again flask 250 c.c. connects with flask 400 c.c. and vacuum is broken.

By suitable manipulation of the 600 c.c. container, pressure control, and changing positions of R<sub>1</sub> as shown, four complete extractions may be made, after which the mercury is forced against and closes R<sub>2</sub>. Flask 250 c.c. is removed and well shaken

(continued overleaf)

## Production of Technical Argon

### Progressive Fractionation Methods Discussed

**M**ODERN practice in the production of technical argon was discussed in a paper presented at the meeting in Manchester on March 18 of the North-Western Branch of the Institution of Chemical Engineers. The contributors were J. B. Axon, M. Pearce and M. Ruhemann.

Describing the properties of argon, nitrogen and oxygen at low temperatures, Dr. Ruhemann, who read the paper, observed that the thermal properties of argon are closer to those of oxygen than to those of nitrogen. Air contains 0.93 per cent by volume of argon and technical argon contains small concentrations of oxygen and varying concentrations of nitrogen.

Liquid air is fractionated for the production of industrial oxygen in two columns, the lower one operates at 5.5 atmospheres abs. pressure and produces "rich" liquid, containing about 40 per cent oxygen, and a "poor" liquid which is nearly pure nitrogen.

The upper column operates at just over 1 atmosphere abs. pressure and produces oxygen at the bottom and nitrogen at the top. The upper column takes "rich" liquid as feed at the correct plate and uses "poor" liquid as reflux. The reflux condenser for the lower column acts as re-boiler for the oxygen at the bottom of the upper column.

Technical argon is produced in a third fractionating column, the liquid or vapour feed is taken from a plate below the feed plate of the upper column and contains

very little nitrogen, nearly 10 per cent argon and oxygen.

Three types of reflux for the argon column have proved effective; the first uses the argon product compressed to a liquid in the bottom of the argon column; for the second gaseous nitrogen from the evaporator-condenser of the main air column is condensed in the re-boiler of the argon column; and in the third type 90 per cent argon product is condensed by "rich" liquid which is passing to the feed plate of the upper column.

The feed for the argon column with the third type of reflux enters at the bottom of the column and the bottom liquid product is returned to the main column. Weishaupt's vapour-liquid equilibria were used for plate-to-plate calculations for the argon column with the third type of reflux.

Dr. Ruhemann discussed the design of the argon column with the third type of reflux. He showed the advantage of the use of "rich" liquid to condense the reflux, the dependence of the reflux ratio on the concentration of argon in the feed and in the overhead product, and the increase in nitrogen concentration from plate to plate up the column.

This increase limits the point in the main column from which the feed is taken. The position of the "rich" liquid feed plate on the upper column was shown by plate-to-plate calculations to be very critical. Any oxygen in the argon product is separated by chemical means.

### STABILITY OF POWDERS

(continued from previous page)

to ensure that the reagent dissolves all the NO<sub>2</sub>. The whole is then restored to atmospheric pressure.

For these various operations the powder receptacles are retained in the hot chamber. Determinations are made with a Duboscq colorimeter 10 min. after extraction (Patty and Petty *loc. cit.*). Tests were made with cotton (CP) and BCNL powders. It is thought, however, that the application of the method to explosives is of greater interest than to powders, and some preliminary results are said to be encouraging.

### Belgian Metal Industries

AN ample review of Belgium's rising capacity for metal production will form one of the principal themes of the Liege International Fair (April 29-May 14). Exhibits will represent all phases of metal production and use, from raw material to finished goods. During 1949 Belgian non-ferrous metals industry produced (all metric tons) 133,443 tons of copper, 175,568 tons of zinc, 79,304 tons of lead, 10,408 tons of tin, and 5667 of sundry other metals, a total of 405,390 tons.

Semi-finished products represented 72,484 tons of copper, 32,839 tons of zinc, 21,896 tons of lead, 1097 tons of tin, and 6179 tons of other non-ferrous metals.

## U.S. STUDIES OF AIR POLLUTION

### *Elaborate Equipment to Analyse "Smog"*

**T**HE co-existence in Great Britain and the U.S.A. of more or less parallel problems resulting from the loading of the atmosphere with solid, and sometimes toxic, matter has called forth substantial preventive research programmes in both countries. The work at the principal British centre at Porton, near Salisbury, has been referred to frequently. The parallel work in the U.S.A. is of almost equal interest.

The Stanford Research Institute in California has established a special chemical research laboratory, under the leadership of Paul L. Magill, senior chemical engineer, and the principal smoke research chemist in the U.S.A., known as the Air and Water Pollution Chemical Research Laboratory, in which a thorough physical and chemical investigation is being carried out.

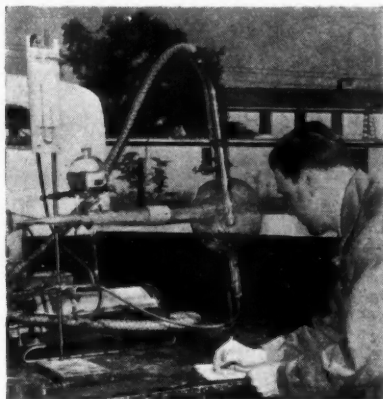
"Smog" characteristically manifests itself in two principal ways: by causing eye irritation and by sharply reducing visibility. A portion of the reduction in visibility is known to be caused by natural haze in the air, and another part by contaminants emitted in the course of the diverse activities of a great city.

#### **Sulphur Trioxide**

In the Los Angeles area—which is unique in that it is by far the largest industrial sub-tropical urban area in the world—the problem of how to assess the quantities of some of these contaminants was encountered. The substance to which much attention has been given is sulphur trioxide, which is sometimes present in relatively large volumes in the Los Angeles atmosphere. Qualitatively, its fog-producing properties were well known. Little was known, however, of the quantitative relationship between sulphur trioxide concentration, relative humidity, and visual range.

To study these relationships it was necessary to design equipment capable of measuring, under controlled conditions, the decrease in intensity of a light beam travelling through long paths of air polluted with low concentrations of the atmospheric impurities, including sulphur trioxide. The development of the "transmissometer," now operating in the Air and Water Pollution Chemical Laboratory, was one result.

The transmissometer's complete system includes a 40-foot-long chamber through



*This apparatus scrubs the air with water to collect a sample of airborne dust and mist*

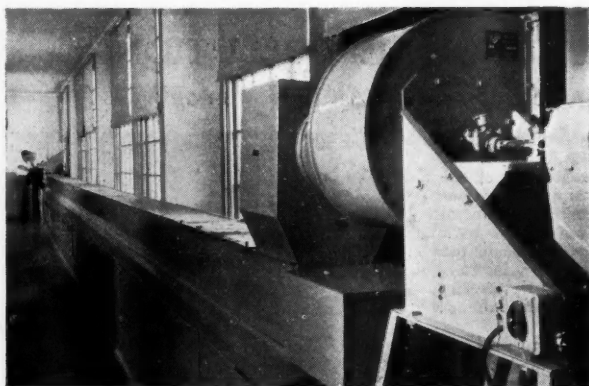
which the test air passes, apparatus for generating and mixing in the desired amount of contaminant and a light source which sends out a beam of modulated light of constant intensity. A system of mirrors reflects the light beam back and forth through the full length of the chamber until it meets an analyser which measures its final intensity.

#### **Reproduced Contamination**

By adjusting the rate of addition of a contaminant to the rate of air flow through the chamber, research chemists can reproduce concentrations of the magnitude found in the Los Angeles atmosphere.

The outgoing beam of light is interrupted at a frequency of 1080 cycles per second, and the analyser is tuned to respond only to light of that frequency. It is possible thus to eliminate the variable effects which sunlight or other stray light might have on the readings of the analyser.

The reflecting system is composed of three spherically ground, polished mirrors of 20-foot focal length. Two are placed side-by-side at one end of the air chamber and the third at the other end. By slight adjustment of the positions of these mirrors, the light beam can be made to travel the length of the chamber four,



From the far end of the 40-ft. air chamber an operator controls the flow of test air to the blower-exhaust section of the Stanford Research Institute's transmissometer

eight or any multiple of four times before reaching the analyser.

In earlier measurements made with light paths of 80 ft., it was found, for example, that 0.1 of a part per million of sulphur trioxide was sufficient to reduce the visibility to about 0.7 mile at 55 per cent relative humidity. The same concentration of sulphur trioxide at 90 per cent relative humidity reduced the visibility to one-half that distance.

Since 0.1 part per million represents about the upper limit of sulphur trioxide concentrations actually found in the Los Angeles atmosphere, the most recent tests have been made to extend the measurements to lower concentrations. Thus, even though the effect of low concentrations on a light beam travelling 40 or 80 ft. may be negligible, by using mirrors to make the path twenty times as long (800 ft.), the effect is magnified sufficiently to be easily measurable with accuracy. Experiments on these lines are now in progress. The analyser is a photo-electric

tube on which the light beam falls; an amplifier which is tuned to the frequency of the light beam and which amplifies the output of the phototube; and a recording potentiometer which makes a permanent record of the light intensity.

In practice, the intensity of light is measured after it has passed through approximately 800 ft. of clear air. Then the desired concentration of contaminant is introduced and the light intensity measured again. This affords reliable data on the ratio between visibility and given quantities of atmospheric contaminant.

The transmissometer has been proved practical for determining how greatly given concentrations of sulphur trioxide—or any other impurity—affect visibility. By repeating the test under different relative humidity conditions, research chemists of the Stanford Research Institute have also been able to measure the effect of moisture in producing dense industrial atmospheres, to prevent which increasing research in Britain and America is being devoted.

### Fluorocarbon Plastics for U.S. Industries

**T**HE rapid exploitation in the U.S.A. of the corrosion and heat resistance and some other special properties of fluorocarbon plastic, a polymer of trifluorochloroethylene, has been demonstrated at the Chicago Plastics Exhibition, which opened this week. The adaptability conferred by the properties of the chlorine constituent has been well brought out by the M. W. Kellogg Company's large range of components, in which the thermoplastic (KEL-F) is moulded by the standard methods, and appears also as waxes, greases and oils of polymers of low molecular weight.

Among the actual applications are KEL-F-lined hose and special, soft-pressed seal rings made from graphite, asbestos, and KEL-F for use as centrifugal pump shaft packing. Others include KEL-F-coated high-temperature radio hook-up wire made by two different concerns, hermetically sealed transformer terminals, special gaskets, O and V rings, U cups and diaphragms for special pumps.

A relatively new fluorocarbon-type plastic, KEL-F was developed during the search for corrosion-resistant materials.

## DUST AND FUME CONTROL

### Automatic Filtration and Recovery

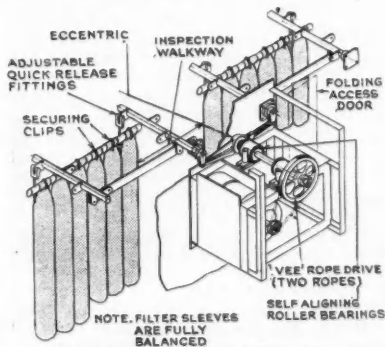
THE operating principles of modernised plant for the control and recovery of dust and fumes in chemical works, etc., are now fully described in a booklet published recently by the Power-Gas Corporation, Ltd. This specification of P-G-Dracco equipment (MB type) is an elaboration of the general information contained in a similar publication released last year (THE CHEMICAL AGE, 60, 865).

The basic principle of the plant is the system of fabric filtration, whereby the gas or fume is passed at a carefully determined velocity through a closely woven fabric medium, upon which the entrained solids are deposited.

The dust laden gases pass along the inlet manifold to an expansion chamber of each hopper, where the larger particles settle out. The finer particles rise with the gas into the filter sleeves, where they are retained on the inside surface, while the filtered gas passes through the outlet valves to the outlet manifold.

At intervals determined by the setting of the cyclic control unit the flow of gas through each compartment is interrupted by the closure of the automatic isolating valve. The filter sleeves are subjected to a vigorous shaking action and the dislodged dust settles rapidly in the hopper.

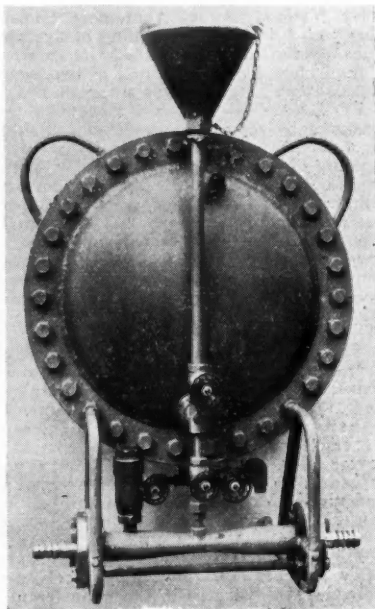
If a subsidiary valve is fitted, clean air or gas passes in a reverse direction through the sleeves, greatly assisting the dislodgement and settling of the dust. The vibrating unit then stops and the valve opens again, ready for further use. After a suitable interval, the next compartment goes through the same cycle.



The filter sleeves and oscillator

## TREATED WATER SPRAY

### Protection from Air-Borne Dusts



The diaphragm and injector

SUPPRESSION of dust in mines, quarries and many other industrial activities has long been a primary subject of research. The reduction of the incidence of silicosis and pneumokoniosis has provided one of the principal incentives. Increasing mechanisation in British mines has aggravated the dust problem, but in many instances machines equipped with jets or sprays are contributing a solution.

The extensive use of water in coal mines is, however, not without serious disadvantages such as that of swelling of the floor ("pucking"), or the formation of pools.

Progress towards a solution of the problem is shown in the Teepol injector, which, after searching tests of prototypes by the Ministry of Fuel and Power, is now coming into use in British collieries.

One of the main obstacles to the use of wetting agents for dust suppression in mines has, in the past, been the difficulty of maintaining a constant flow of treated

(continued at foot of next page)

## Technical Publications

THE National Smoke Abatement Society this year celebrates its coming of age and the Spring, 1950, issue of its journal "Smokeless Air" is the first of two issues which survey its progress since 1929. The main feature deals with a review of the preliminary report by the Public Health Service of the U.S. Federal Security Agency on the Donora "smog" disaster of 1948. The biological aspect is covered by Dr. J. S. G. Burnett, Medical Officer of Health for Preston, and Dr. A. R. Meetham, of the National Physical Laboratory, formerly superintendent of observations for the investigation of atmospheric pollution DSIR, deals with the atmospheric studies.

DIFFERING compositions and temper of aluminium and aluminium alloys are described in "The Properties of Aluminium and Its Alloys," information bulletin No. 2 now available from the Aluminium Development Association. The booklet covers main groups of materials and types of heat treatment; specifications; physical and mechanical properties; durability and working methods.

COMMON faults that can occur in arc welds in mild and low alloy steels are defined and illustrated in the main feature of "Welding Research" (Vol. 4, No. 1), journal of the British Welding Research Association, and there is a résumé of recent published information on the flash and butt welding of light alloys.

ONE result of the co-operative research between the Road Research Laboratory of the DSIR and the British Road Tar Association has been the development of dense tar surfacing. Typical specifications intended to serve as a guide to manufacturers and users of the material have now been issued by the association.

A DICTIONARY of Colours for Interior Decoration has now been produced by the British Colour Council to facilitate colour co-ordination and to give authoritative references and illustrations to colours regularly used in the materials prepared to-day. The work is in three volumes, the first two being devoted to 378 colours on three surfaces, gloss, matt and pile fabric, while the third contains an index of 500 names cross-referenced with the other volumes.

PARTICULARS of the fine and special steels being produced in France are given in a book "Les Acier Fins et Spéciaux Français," produced by the Chambre Syndicate des Producteurs d'Aciers Fins et Spéciaux. Its usefulness is enhanced by the inclusion of a dictionary of technical terms in English, French, German and Spanish.

\* \* \*

AN improvement of Herold's method of phase reversal, resulting in a still higher value of the conversion transconductance is studied by G. Diemer and K. S. Knol in "Philips Research Reports" (Vol. 4, No. 3; Philips Electrical, Ltd.). Other features deal with ionospheric double refraction (H. Bremmer); high-pressure rare gas discharges (W. Elenbaas); and proposals and recommendations concerning the definitions and units of electromagnetic quantities (P. Cornelius).

### TREATED WATER SPRAY

(continued from previous page)

water of the correct strength at operating points. Particular attention has been given to this in the design of the new injector, which has been built and developed by the Permutit Co., Ltd., in collaboration with the chemists and engineers of Shell Chemicals, Ltd.

The injector, by the introduction into water systems of controlled quantities of wetting agent (Teepol) reduces by as much as 50 per cent the quantity of water required. The equipment consists essentially of a venturi throat and a dual container. The dual container comprises two bowl-shaped vessels about 2 ft. in diameter, bolted rim to rim, separated by an internal rubber diaphragm.

As water from the main flows through the venturi, pressure created at the throat forces a trickle of water into the water-containing side of the container. This slowly pushes the diaphragm towards the side containing the wetting agent, so that the latter is gradually forced into the low-pressure side of the venturi, to mix with the main flow of water.

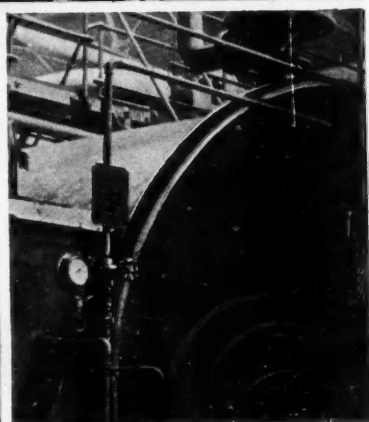
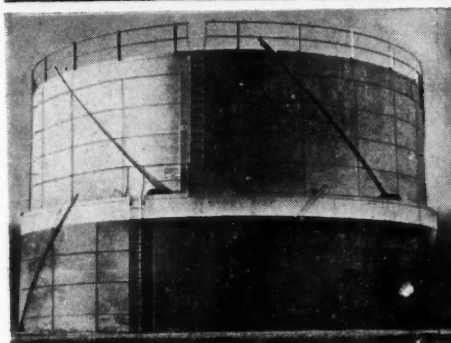
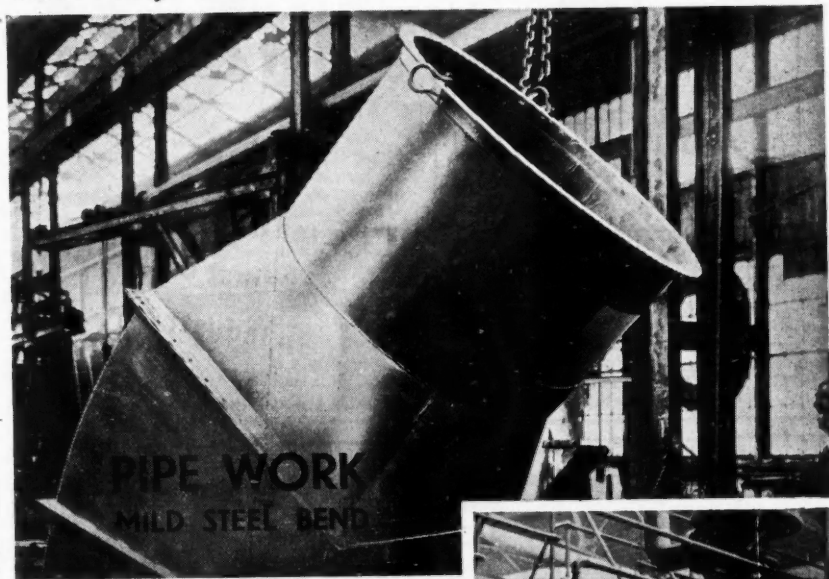
Full details of this new system are given in "The Suppression of Dust in Coal Mines," now available from Shell Chemicals, Ltd.



# Metallurgical Section

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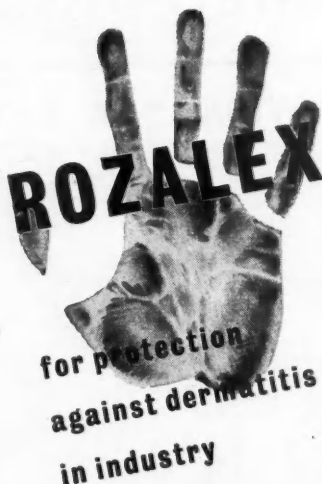
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# Metallurgical Section

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1 April 1950

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## U.S. TITANIUM PROGRESS

### *Prospects of Hastening Commercial Developments*

**R**ATHER less than two years have elapsed since the strong, durable and corrosion-resistant metal, titanium, began to attract significant commercial attention. While it is still a youngster whose potentialities have still largely to be determined by laboratory research, the next decade is generally expected to see this newcomer grow in importance and acquire as wide a standing as the universally-used metals.

Titanium, discovered in Cornwall in 1790 by William Gregor, an English vicar who also distinguished himself as a mathematician and mineralogist, did not find any practical applications until after World War I. Then some titanium pigments were commercially introduced. Large advances have been made since, and today many of the best paints contain titanium dioxide refined from the minerals ilmenite or rutile.

Chemically, the element is about in the middle of the periodic table, being grouped with zirconium, cerium and thorium. It has an atomic weight of about 48 and melting point of 1800° C., which is nearly the same as of platinum. The high melting characteristic was familiar in the past, when titanium's presence in many iron ore deposits made them unpopular because the ores could not be smelted by standard blast furnace methods. Now it is encouraging to observe that Dr. E. A. Gee, of the E. I. du Pont organisation in the U.S.A., is optimistic about the possibility of attaining tonnage production of titanium metal.

#### **Promising Investment**

It was anticipated at a recent national meeting of the American Chemical Society that several years may be required to establish fully what are the potential market factors. Chemists reported that they were improving the ingot process which du Pont developed about a year ago. Titanium research is an impressive example of how business enterprises in Britain and the U.S.A. are investing in projects which are likely to result in new products and

new markets. The development may also help to conserve other metals of which reserves show signs of depletion.

Progress has been reported in the use of titanium as an addition to steel to facilitate deep stamping, to inhibit corrosion, and to increase tinning and galvanising capacity. It confers certain desired features on cast iron, hard carbide alloys and welding rods, but little is known about its alloying capabilities.

There are indications of possible wide usage on jet aircraft engine parts and structural members of machines. Inferences have been made upon its potential strategic importance, but until the recent publication of Barksdale's excellent book "Titanium," little systematically collected information was available.

#### **Reduction of Costs**

The present price of titanium ingots of uniform and good quality continues to limit the consumer fields. Alex Stewart, director of research of the U.S. National Lead Co., has recently recorded that the major concern of present research was to reduce costs.

Further indications of the prospects of the metal in the U.S.A. have been provided by an exploratory study of a titanium deposit in Hot Spring County, Arkansas, conducted by the Bureau of Mines, by which it has been described. As part of the programme for developing titanium metal, research is now going forward at the Mississippi Valley Experimental Station to develop methods of concentrating and utilising Arkansas ores.

This publication also gives the results of metallurgical tests made by the Bureau, and discusses the history of various deposits and the character of the ore.

(Report of Investigations 4592, "Investigation of Christy Titanium Deposit Hot Spring County, Ark.," by Donald F. Reed; the Bureau of Mines, 4800 Forbes Street, Pittsburgh 15, Pa., U.S.A.)

## Zirconium and Its Compounds

### Recent Development of their Industrial Uses

UNTIL comparatively recently, zirconium was regarded as a rare metal, although it has been estimated that it is almost as abundant in the earth's crust as carbon.

Concurrent industrial use of titanium-bearing sands of Florida led to the separation of large quantities of zircon as a by-product, states Mr. W. B. Blumenthal, chief chemist of the Titanium Alloy Manufacturing Division of the National Lead Company (U.S.A.) in an article in *Chemical Industries*.

#### Replacing Tin Dioxide

Mr. Blumenthal states that his company, developed a zirconium dioxide ceramic opacifier which served initially as a substitute for tin dioxide, then scarce and expensive. The new product contained 90 per cent zirconium dioxide. Later another opacifier, consisting of 98.5 per cent zirconium dioxide, was offered to the ceramic industry.

Zircon, too, was found excellent for use in frits to produce opacity, replacing antimony oxide for this purpose. Conversion of zircon to double silicates of zirconium and certain elements of Groups 1 and 11 formed products particularly useful in ceramic glazes and zircon porcelains.

The researches during World War I developed industrial methods for producing soluble salts of zirconium, such as chlorides, sulphates and acetates, but a sizeable demand for these salts did not arise for several decades.

A passing interest in zirconium salts for use in silk weighting occurred in the late twenties.

During the 'thirties there was a great growth of the zirconium ceramic industry and the beginnings of the growth of a stable zirconium chemical industry. Both had assumed considerable importance by the end of World War II, although sales of zirconium chemicals were only a small fraction of those of ceramic products.

World production of zirconium concentrates in 1946 was 25,000 short tons. Of this, 6400 tons were obtained from a 50-mile stretch of Australian beach between Byron Bay, New South Wales, and Southport, Queensland.

The ceramic uses of zircon and zirconia arise from the high reflectivity of light, high melting point and thermal stability,

chemical inertness (particularly of zircon) and high specific gravity. As refractories, they are used not only in crucibles, furnace construction and insulation for electric heating elements, but more recently in jet engine exhausts.

Some of the more important applications are melting aluminium, production of metaphosphates, smelting of glass and of raw mixtures for enamel and glaze frits, ramming mixtures in induction furnaces and furnace blocks. In melting aluminium the resistance of the zircon to "wetting" by the molten aluminium is the primary advantage.

Chemical inertness is an additional asset and permits the construction of equipment where extreme resistance to chemical action is required. An example is in the construction of rotary calciners where acidic materials must be handled. The high specific gravity of zircon is particularly useful in crucibles for melting aluminium, because spalls and fragments of the crucible material settle to the bottom instead of floating in it.

#### Improved Refractories

Until recently zirconia refractories suffered from lack of resistance to thermal shock due to a change in crystalline form at about 1000°C. Now thermal shock stability has been achieved by addition of small quantities of lime and magnesia.

The complexity of the chemistry of zirconium is responsible for its usefulness in chemical industry, where it can function because of its amphoteric nature, its large covalency, and the unusual variety of ions it is able to form.

The largest consumption of soluble zirconium compounds is to render textiles water-repellent. The second largest use of zirconium salts in 1948 was manufacture of pigments. Zirconium is a precipitant for acid dyestuffs, and, when properly controlled, coloured pigments of excellent general properties and outstanding tinctorial strength are obtained. These are particularly suitable for printing inks.

Zirconium salts also tan leather; the sulphate has been found most satisfactory. Other present or prospective uses of zirconium chemicals are in the mordanting of textiles, preparing incandescent gas mantles, catalysing organic synthesis and hydrocarbon cracking, and in medicine.

## NEW STEEL CAPACITY

### Full Equipment at Scunthorpe

**H**IGHER output and greater economy and efficiency, to which a good deal of ancillary chemical process equipment will contribute, are among the benefits likely to accrue from the development programme of John Lysaght's Scunthorpe Works, Ltd., now nearing completion.

Additions to by-product recovery plant and erection of an electrostatic plant to clean 10 million cu. ft. of gas an hour from the blast furnaces will ensure that the iron and steel making operations do not lose the benefit of any of the incidental products.

A modern, continuous mill, capable of producing 9000 tons of billets a week, should be in operation by the end of June.

Steel-making capacity, which is to be increased 50 per cent, will be served by an additional 120-ton furnace and the enlargement of three 65-ton furnaces to 120 tons.

Other new equipment will include four 175-ton electric overhead cranes, a mould-conditioning shop, and a gantry with three 15-ton overhead cranes for scrap.

A cogging mill, to roll 4-ton ingots, will be powered by a 6650 h.p. electric motor, and a six-stand continuous mill, powered by a 4000 h.p. motor, will roll steel billets.

The whole development is described as one of the largest undertaken in a British iron and steel works. Another plant, to make rods, will start in 1951.

## PRACTICAL RESEARCH

### BISRA's Steelworks in Miniature

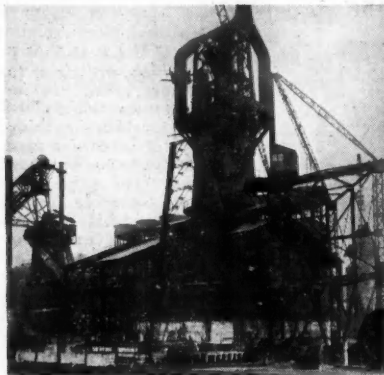
**A** NEW technique in steel research, a station that will have much of the equipment of a steelworks in miniature, is being adopted by the British Iron and Steel Research Association in Sheffield during the next few months. Pilot steelworks plant for melting, rolling, drawing and forging, to try out research results before application to production plant, is to be installed in buildings to be erected on a 2½ acre site at Hoyle Street.

Steel melting will be carried out in a 10-cwt. capacity electric arc furnace, which will be used for work on sulphur elimination and on electric furnace practice.

A high-speed 14 in. 4-high cold strip rolling mill will enable BISRA's research staffs to carry further their investigations into such things as "roll force," the measurement of which gives rolling mill makers and users the equivalent of the boiler engineer's steam pressure gauge in working out safe and economical loads. On a smaller 2-high mill valuable work has already been done by BISRA's rolling section.

BISRA will have its own experimental wire drawing plant in the new buildings, where it will be possible to carry out trials of new processes before they go on to the full scale production plant.

The new buildings, to cover 88,000 sq. ft., will cost about £250,000.



Indicating the scope of the £9.5 million development at John Lysaght's Scunthorpe Works, Ltd., are (left) the company's new blast furnace, in course of construction, and (right) the rolling mill building, in which is housed the Morgan continuous billet mill

## Nickel-Clad Steel

### Simplified Engineering for Corrosion Resisting Vessels

A COMMON chemical engineering problem concerned with the discriminating choice of materials is presented in the construction of beet sugar extraction plant. The contribution made by nickel to its solution is the subject of technical notes which appear in the current issue of *The Nickel Bulletin* (23, No. 2, 26).

This describes the work of Cocksedge & Co., Ltd., in carrying out repairs on plant which, after the war, could not have competed with the cane sugar industry.

The company, which manufactures diffusion batteries in which the sugar is extracted from the shredded beet, uses nickel-clad steel for the diffusers and claims that this material is both corrosion resistant and relatively cheap.

A diffusion battery comprises 14 large pressure vessels, each holding 6 tons of beet. Hot water at about 200° F. is circulated through the diffusers in series, entering a unit containing beet from which most of the sugar has been extracted, and leaving from a unit charged with fresh beet. Such a battery operates 24 hours a day for over 100 days a year. Up to 1800 tons of beet a day can be handled by the largest batteries.

When the maximum amount of sugar has been extracted, the charge from the

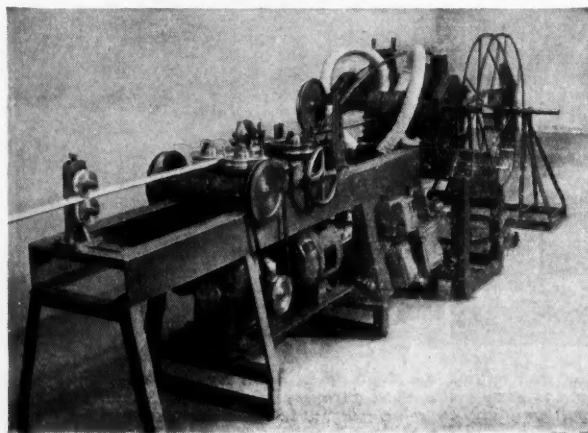
unit is pumped to filter presses. The liquor extracted is returned to the diffuser battery to reduce water consumption, conserve heat and retrieve the sugar contained. This returned liquor is low in oxygen and slightly acid, and corrosive attack was experienced on the mild steel formerly used for diffuser bodies.

Nickel, in contact with the corrosive medium, and steel to carry the bulk of the stress are now indicated for construction of heavy equipment of this kind.

For the diffusers,  $\frac{3}{8}$ -in. nickel-clad steel plate with 10 per cent cladding was selected. Fabrication presented few difficulties and the facility with which nickel-clad steel can be handled is aided by the fabrication of the cone-shaped end sections. Each end section consists of 4 or 6 plates which are first hot-pressed to shape and then butted together for welding.

Welding is carried out on the steel side first, no V preparation being necessary. The nickel side is then carefully chipped away with a round-nosed chisel down to the steel weld to give a base of clean, sound metal. The sealing weld in the groove is made with a pure nickel rod, thereby ensuring a continuous nickel surface on the inside of the vessel. After construction, each diffuser is tested to 80 p.s.i.

## Aluminium Sheathing of Cables



**E**QUIPMENT which promises to increase the use of aluminium to replace lead for the sheathing of electric cables and other purposes has been constructed by the Pirelli-General Cable Works, Ltd. (associate of G.E.C.), in whose research laboratories was developed the cold pressure welding process employed. Cable-sheathing by this method is claimed to be continuous, the aluminium strip being joined by brazing carried out without interfering with the welding process.

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## CANADIAN NICKEL RESULTS

### Cost and Market Fluctuations

THE reduction in net earnings of the International Nickel Company of Canada, Ltd., during 1949 seems to have represented factors common to many overseas metal enterprises. It was attributed by the chairman, Mr. Robert C. Stanley, largely to increased costs of labour, supplies and services and a fluctuating demand for the metal in the U.S.A. The lower prices for copper and platinum metals were other contributory factors.

Proven ore reserves at the end of the year were 251,805,000 short tons, compared with 246,177,000 at the end of 1948, and the nickel-copper content was 7,630,000 tons, compared with 7,503,000 the previous year.

Underground development in the operating mines extended a further 84,654 ft., bringing the total development to more than 266 miles.

Progress was reported on the project for the mining of lower grade ores from the Creighton Mine. A shaft is being sunk approximately 2000 ft. and a new concentrator, under construction, should be completed by 1951. The concentrator will have a capacity of 6000 tons per day and will supply the concentrate by pipeline to Copper Cliff, about  $7\frac{1}{2}$  miles distant.

Capital expenditure in 1950, estimated at \$22 million, will be required to expand mining activity on the completion of the open pit working at Frood-Stobie, to finish the construction of plant for oxygen flash smelting of copper concentrates and to provide more housing for staff.

### Natural Gas for Aluminium

THE Aluminum Company of America has begun operations at its new Point Comfort Reduction Works, near Port Lavaca, Texas, which is designed to produce 110 million lb. of aluminium per year. Natural gas will serve as the chief source of power for the electric generating equipment, which will have at total of 80,000 kW installed capacity, using more than 30 million cu. ft. of natural gas each day to power 120 internal combustion engines. Installations include a plant for the manufacture of carbon electrodes required in the electrolytic aluminium-producing process, and a reduction plant in which aluminium will be produced from purified aluminium ore. Aluminium is produced at Point Comfort fundamentally by the same process as that discovered in 1896 by Charles Martin Hall.

## STEEL TECHNOLOGY

### Some U.S. Advances in 1949

THE United States, by far the largest of the world's producers of steel, made good progress during 1949 in putting into operation new units of the huge modernisation and improvement programme launched since the war.

This statement is made by the United States Steel Export Company in a report which describes some of the major advances in the technique of American steel production last year.

The Carnegie-Illinois Steel Corporation, after 10 years of experimentation, is prepared for commercial production of low carbon (0.03 per cent maximum) stainless steels, states the export company. These are claimed to have resistance to intergranular corrosion equal to that of 18-8 stainless steels to which columbium and titanium stabilisers have been added.

Welding tests demonstrated that they can replace the stabilised types for applications such as welding, that involve short heating times in the sensitising temperature range.

The Geiger counter has been adapted by scientists of the Research Laboratory, United States Steel Corporation of Delaware, to develop a quick and accurate method of analysing steel samples. After careful calibration for many specific problems, Geiger counter analysis is expected to be faster than the direct-reading spectroscopy.

A new system of sorting rapidly various grades of stainless steels and detecting residual elements was devised at the Wood Works of the Carnegie-Illinois corporation. The metal analyser consists of a fixed-deviation glass prism spectrometer, mounted on a portable cabinet. The visible range coincides with the visible range of the spectrum and may be increased by the use of photographic attachments.

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## PERSONAL

**D**R. E. K. RIDEAL, lately director of the Davy Faraday Research Laboratory and Fullerian professor of chemistry in the Royal Institution, has been appointed to the chair of chemistry King's College, University of London, from August 1. His appointment, and that of Mr. G. TYSER, to the board of Monsanto Chemicals, Ltd., has also been announced.

MR. BARRIE HEATH has been appointed to the board of Powell Duffryn Carbon Products, Ltd., as managing director. DR. D. B. FOSTER, of the company's research laboratories, has also joined the board.

COLONEL M. A. McEVOY has joined the board of directors of Bamag, Ltd., London. He has been closely connected with heavy engineering for many years, and lately has travelled widely to ascertain what are the principal needs of foreign markets for British machinery.

MR. FRANK PARR, an executive of the British Iron and Steel Federation, is joining the Whitehead Iron & Steel Co., Ltd., and its associated companies as a special director.

LORD BOYD ORR, Chancellor of the University of Glasgow, and LADY BOYD ORR have accepted an invitation to attend the annual dinner associated with the Royal Institute of Chemistry's anniversary meetings in Glasgow (March 31-April 1).

MR. ROBERT H. S. ROBERTSON, the Glasgow consultant in raw material development, addressed the Dust Technique Group of the Society of German Engineers, at Duisberg, on March 30, on "The Micromeritics of Clay Minerals."

DR. N. H. HARTSHORNE, lecturer in chemical microscopy, University of Leeds, has been appointed to be reader in the same subject.

MR. NORMAN SHELDON has been re-elected chairman for 1950 of the British Chemical Ware Manufacturers' Association, Ltd.

At the recent annual general meeting of the Newcastle-on-Tyne Chemical Industry Club, the following officers and committee were elected for 1950/51: President: MR. A. TROBRIDGE; vice-presidents: PROF. G. R. CLEMO, MESSRS. CLIVE COOKSON,

J. W. CRAGGS, B. H. HILL, R. H. F. HOUSTOUN, A. KELLY, H. DUNSFORD SMITH, S. A. WIKNER. Chairman: MR. W. S. COATES; hon. librarian: MR. S. IRVINE; hon. treasurer: MR. S. DAWSON; hon. secretary: MR. W. A. BRIGGS. Committee: MESSRS. F. W. BELL, L. BONSER, W. JEFFERY, J. McMANUS, B. RICHARDSON, F. SCOTT, H. THOMPSON, H. F. WINSHIP.

MISS E. M. R. DITMAS has retired from the post of principal officer of the Association of Special Libraries and Information Bureaux in which she has served since 1933, as secretary and since 1946 as director. Miss Ditmas is succeeded by MR. LESLIE WILSON, a former scholar of Trinity Hall, Cambridge, and foreign editor of the *Times Educational Supplement*.

## OBITUARY

THE death was reported this week of PROFESSOR CHARLES STANLEY GIBSON, Emeritus Professor of Chemistry in the University of London at Guy's Hospital Medical School.

The professor was born in Manchester in 1884 and educated at Corpus Christi College, Oxford, where he took an honours degree in chemistry in 1905. Four years later he was appointed senior research student of the Goldsmiths' Company at Oxford, and shortly afterwards obtained a post as assistant lecturer and demonstrator in Cambridge University chemical laboratory.

He spent a number of years abroad, first in India where he was appointed professor of chemistry at the Maharaja's College, Trivandrum, in 1912, and then in Egypt where he held the post of professor of chemistry at the Cairo School of Medicine from 1919-1920. In 1916 he was honorary adviser to the chemical warfare committee of the Ministry of Munitions. He became professor of chemistry at Guy's Hospital Medical School in 1921 and continued to serve there until recently.

Professor Gibson was honorary secretary of the Chemical Society from 1924 to 1933, and president of the chemistry section of the British Association meeting held at Cambridge in 1938. He was the author of "Essential Principles of Organic Chemistry" and wrote numerous papers, most of which were devoted to chemotherapy.



# HOME

## Automatic Arc Welding

As from April 1, all sales and service for Unionmelt Automatic Arc Welding equipment in the United Kingdom will be handled by the Quasi-Arc Co., Ltd., at Bilston, Staffs.

## Stress Analysis Conference

The fourth annual conference of the Stress Analysis Group of the Institute of Physics will be held at University College, London, from April 3-5. The conference will provide sessions on brittle lacquers, the use of models in structural work and the application of experimental stress-analysis methods to soil mechanics.

## Suspension of Lead Rationing

From today (April 1) lead will be obtainable for consumption without restriction on the amount in a given period. The Ministry of Supply, making the announcement, states that the availability of larger supplies has made possible the suspension of rationing.

## New Laboratories

Dr. V. E. Yarsley, consultant in plastics chemistry, has recently purchased Oaklands, Clayton Road, Hook, Surrey, to which, after modifications, the organic laboratory will be transferred from Wall-sall, Staffs., and the physical and surface coatings laboratories from Ewell. Later, the technological laboratories will follow.

## £3 m. Oil Plan Postponed

Postponement of a £3 million scheme to establish an oil refinery at Tynemouth, as a result of the national policy of restriction on capital expenditure, is announced. A Ministry of Fuel spokesman states that there is no chance of the project starting this year and little chance next year. The scheme would have employed crude oil brought direct to the Tyne in tankers to an oil refinery to be established at East Howdon by Trent Oil Products.

## Chemical Export Control

Some changes in export licensing control come into operation today (April 1). Among the goods which will not now require export licences are coal-tar products (other than phenol) and a long list of drugs and pharmaceuticals. Licences will be required for certain additives to mineral oil, some specified plastic materials and certain drugs and chemicals. The last include aluminium chloride (anhydrous) barium nitrate and metallic sodium.

## Export of Linseed Oil

A limited quantity of processed linseed oil is now being released for export, records a Press note from the Board of Trade. In addition, and in special cases, applications to export raw linseed oil in small quantities will be considered.

## Coal Output Rises

Production of coal last week reached 4,380,710 tons (4,118,110 deep-mined and 262,600 opencast) compared with 4,289,000 tons in the corresponding week of last year. There were 700 fewer colliery workers.

## New Telephone Numbers

W. & J. George & Becker, Ltd., the laboratory furnishers, of Hatton Wall, London, E.C.1, have added three telephone lines to their private branch exchange. The numbers are **HOLborn** 5483-5.

## Continued Control of Molasses

A Press note from the Board of Trade on Wednesday reverses the announcement made on March 22 that molasses could be imported privately after April 1 (*THE CHEMICAL AGE*, 62, 398). The new statement indicates that the announcement was made in error.

## Canadian Laboratory Contract

Baird & Tatlock (London), Ltd., has received the order to supply the metal unit laboratory furniture required for the first part of the new laboratories being constructed for the Department of Health in Ottawa. The order is understood to be worth about £19,000.

## New Sales Office

The sales office of A. Boake, Roberts & Co., Ltd., at "Ellerslie," Buckhurst Hill, Essex, will be closed on April 14 and replaced by a new office at 100 Carpenters Road, Stratford, E.15 (MAYland 5511). This centralises all the company's office administration at Stratford.

## 1950 Trade with Poland

A trade agreement recently concluded with Poland provides for the purchase by this country from Poland of manufactured goods valued at £2.2 million. Among the most important of these are textiles, casein, chemicals, china and glassware, wrapping paper and board. British exports to Poland, estimated at £1.3 million, will include pharmaceuticals, insulating and pressure-sealing materials, engineers' and hand tools.



## Next Week's Events

### MONDAY, APRIL 3

#### Society of Chemical Industry

London: Main lecture theatre, Huxley Building, Exhibition Road, South Kensington, S.W.7, 2.15 p.m. and 5.15 p.m. (Two sessions). Symposium on "Distillation"; Prof. F. H. Garner: "Some Fundamental Problems in Distillation"; H. Kaye: "Recent Advances in Distillation in the Petroleum Industry"; C. W. Allen: "Distillation of Water"; C. R. Dobson: "The Distillation of Industrial Alcohol, present day practice."

#### Oil and Colour Chemists' Association

Hull: Royal Station Hotel, 6.30 p.m. Dr. D. R. Evans: "Some Aspects of the Protection of Iron and Steel Against Corrosion."

### TUESDAY, APRIL 4

#### Chadwick Public Lecture

London: Livingstone Hall, 42 Broadway, Westminster, S.W.1, 2.30 p.m. Charles E. Scholefield: "Rivers Pollution and the River Boards Act, 1948."

#### Incorporated Plant Engineers

Cardiff: Grand Hotel, Westgate Street, 7.30 p.m. (South Wales Branch). Annual general meeting.

#### The Royal Institute of Chemistry

Liverpool: (Liverpool and North-Western Section), 7 p.m. Annual general meeting. Prof. F. S. Fowweather: "The Laboratory Examination of Service Recruits."

### THURSDAY, APRIL 6

#### Institute of Metals

Birmingham: James Watt Memorial Institute, Great Charles Street, 6.30 p.m. (Birmingham Local Section). Annual general meeting.

London: 4 Grosvenor Gardens, S.W.1, 7 p.m. Discussion on "Creep." Opening speaker: N. P. Allen.

#### The Chemical Society

Dundee: University College, 5.15 p.m. (St. Andrews and Dundee). Dr. F. S. Dainton: "Chemical Reactions Induced by Nuclear Radiations."

#### Textile Institute

Manchester: 16 St. Mary's Parsonage, 7.15 p.m. Address by Prof. J. B. Speakman.

### FRIDAY, APRIL 7

#### The Chemical Society

St. Andrews: United College, 5.15 p.m. (with St. Andrews University Chemical

Society). Prof. R. D. Haworth: "Developments in the Chemistry of cyclo-Heptane Derivatives."

#### Incorporated Plant Engineers

Birmingham: Imperial Hotel, 7.30 p.m. A.G.M. followed by films "Through the Mill" and "The Tube Age."

### Oil and Colour Exhibition

THE London section of the Oil and Colour Chemists' Association is again to organise a technical exhibition at which suppliers to the paper, printing ink and allied industries will present their latest work on materials, plant and apparatus. The exhibition will be held at the Borough Polytechnic, London, S.E.1, and will be open from 3-9 p.m. on April 13 and 14.

Among the exhibitors will be the Paint Research Station, Teddington, which will illustrate the application of modern chemical and physical techniques to paint research problems. Other displays include National Titanium Pigments, Ltd., Shell Chemicals, Ltd., Townson & Mercer, Ltd., British Industrial Solvents, Ltd., and the Geigy Co., Ltd.

### LETTER TO THE EDITOR

#### Toxic Agricultural Chemicals

SIR,—We were very interested to read your article on toxic agricultural chemicals in THE CHEMICAL AGE of March 11 and we were glad to see that you emphasised Dr. Hunter's warning against the promiscuous use of these new compounds by unskilled operatives.

We have made a close study of the toxic properties of these materials and all spraying of them carried out by our Contract Spraying Service is done under the strictest supervision, employing safeguards which go even beyond Dr. Hunter's recommendations.

In your article you make a plea for an "amber" waiting period before these materials are put into wide use. May we suggest that this period could be very well covered by restricting the use of these chemicals to experienced contractors who have an adequate medical and safety organisation.—Yours, etc.,

M. N. GLADSTONE.

General Manager.

Pest Control, Ltd.,  
Bourn, Cambridge.

## OVERSEAS

### Vitamin D Manufacture

The German High-Vacuum Works, Uetersen, Holstein, has recently started to manufacture vitamin D, supplies of which had to be imported after the war.

### U.S. Bauxite Production

Domestic mine production of bauxite in the U.S.A. in the last three months of 1949 increased to 323,266 long tons (dried equivalent), according to the U.S. Bureau of Mines. This was the highest quarterly output for the year, but preliminary totals estimated at 1,139,115 tons for the whole year show a decline of 22 per cent on 1948.

### Austria's Expanding Chemicals

Production of trisodium phosphate from bone waste from the manufacture of glues is planned by a Vienna firm, while another enterprise in Baden has begun the manufacture of sodium sulphide. Another expansion is the production by the Styrian Chemical Works, Ltd., of flotation chemicals for use in the mining industry.

### India's Aluminium Output

A production figure of 3550 tons for the current year has been fixed by the target committee for the aluminium industry. The target, fixed by a meeting recently held in Calcutta, was based on output in 1948 and 1949. Problems of electric power, movement of petroleum coke through Pakistan, and transportation of bauxite may hinder the achievement of this target.

### Wider Use of Mathieson Mercury Cell

The Mathieson stationary mercury cell technique is being adopted by the chemical plants division of the Blaw-Knox Company, Pittsburgh, Pennsylvania, in the construction of chlorine and caustic soda plants. Developed by the Mathieson Chemical Corporation, the process permits the economical production of both chlorine and caustic pure enough for direct use in the manufacture of viscose rayon.

### University of Technology Opened

Many prominent people attended the laying of the foundation stone of the New South Wales University of Technology at Kensington, near Sydney, on Saturday, February 25. A research professorship in mechanical engineering has been provided by Lord Nuffield. A message pledging his co-operation was received from Prof. M. L. Oliphant, who goes out to Australia next year as director of the Research School in Physics of the Australian National University.

### Italy Offers German Chemical Shares

The German participation in the Società Italiana di Litopone—200,000 shares at 50 lire each—is offered for sale at lire 150 million by the Ufficio Beni Alleati e Nemici, Italian Ministry of the Treasury.

### Brass for Non-Sparking Tools

The National Corporation Sonderbronze, of Berlin-Oberschöneweide, at the Leipzig Fair will exhibit a new type of brass, used for the manufacture of non-sparking tools. The brass is claimed to be a complete substitute for beryllium.

### East German Paint Research Laboratory

The Association of Nationalised Paint and Lacquer Manufacturers in Eastern Germany is to establish this year a research laboratory in Magdeburg. To achieve more economical working, the association, which now embraces 33 units, plans to merge these into a few large concerns.

### U.S. Sulphur Output in 1949

Production of native sulphur in U.S.A. in December totalled 392,655 long tons and the output for the year of 4,745,014 long tons was only slightly lower than in the record year of 1948. Producers' stocks were 3,099,305 long tons, a decrease of 123,709 compared with the previous year.

### Modified Ethylene Process

A modified process for producing ethylene has been described in the U.S. by R. M. Deansley and C. H. Watkins, both of the Universal Oil Products Company. In producing ethylene from refinery gas for the production of ethylene glycol, air or oxygen is admitted to the catalytic reactors. The heat needed for the reaction is supplied by the combustion of coke formed by the reaction itself. Advantages claimed are better yields of ethylene and the possibility of using impure feed chemicals.

### Italian Nicotine Programme

Experiments are being made in Italy in the cultivation of varieties of tobacco plant intended solely for the production of highly concentrated nicotine. A special factory is also planned which will utilise by-products of tobacco for the production of anti-pest products. Italy is the largest tobacco producer in Europe; about 64,500 tons were produced there during the past campaign. At present the crop occupies some 65,000 hectares. Tobacco is a State monopoly in Italy.

## SOUTH AFRICAN CHEMICAL ENTERPRISE

### Government Interest in Development Schemes

From Our CAPE TOWN CORRESPONDENT

**O**XYGEN, dissolved acetylene and other compressed gases are now being produced at Germiston by a firm recently established by an international organisation of Canadian origin. Part of this new factory will produce oxygen and part will manufacture dissolved acetylene—the company's two main products. The acetylene factory will use calcium carbide produced in the Union. It is also expected to produce nitrogen, compressed air and oxygen for medical purposes. The company has also acquired a two-acre site at Durban where a similar factory is to be completed, and is expected to start production during this year. The factories concerned will be fully mechanised and will provide employment for some 100 people.

Lining of tanks, containers and filter presses with a protective coating against chemical attack is now being undertaken by a firm recently established in Johannesburg. The lining is basically a synthetic resinous material of the phenol formaldehyde group and is applied by a special stoving process at a relatively low temperature. It is claimed that the lining, which has a high gloss, is durable, tough, chemically inert, non-tainting and completely sterile.

Export of South African fishmeal in excess of local requirements was recently officially approved. Production varies, and last season output was only sufficient to meet local needs. There is, however, said to be a ready market overseas for any surplus, particularly in California.

A rebate of import duty on the materials needed for the manufacture of synthetic resins has been recommended by the Board of Trade and Industries. By developing the synthetic resin industry the Union hopes to make considerable savings in its foreign exchange requirements.

In reply to a question in the House of Assembly the Minister of Economic Affairs said that a memorandum had been received from the Board of Trade and Industries on the proposed establishment of a South African oil-refining industry, possibly in

Durban. The report, however, was not favourable and the Government was not prepared to take steps opposed to the board's advice.

It was felt that the establishment of such enterprises should be left to private enterprise. Any proposals from private individuals or companies would be considered sympathetically, and provided excessive concessions were not required.

Satisfactorily successful results are reported to have rewarded attempts to eradicate the tsetse fly which was formerly prevalent over 7000 sq. miles of territory from the Tugela river to Portuguese East Africa. Spraying of benzene hexachloride has proved most effective, particularly in the otherwise inaccessible gullies of the hilly Hluhluwe district.

The continuance of State interest in a large department of chemical production, the organic products factory at Klipfontein, which is a source of DDT supplies, has been the subject of a good deal of controversy and some alarm by private chemical enterprises in the Union. The factory was operated during the war largely for the production of explosives. Questioned in Parliament whether it was intended to nationalise the factory or to introduce any other legislation to deal with the matter, the Minister of Economic Affairs said the whole position was under consideration.

#### South African Wattle and Bark

Demand for South African wattle bark and extract during 1949 was so large that exporters had difficulties in meeting the requirements. Exports of extract amounted to approximately 94,800 tons (91,100 in 1948) and 7200 tons were delivered to local tanneries—an increase of 1800 tons more than in 1948. Bark exports, 61,600 tons, were also a little higher than in 1948. Total value of both exports was about £5 millions and the U.K. absorbed about 45 per cent (50 per cent in 1948).

## INDIA'S ATTENUATED SOAP INDUSTRY

### *Aim to Revive Production and Exports*

**P**ROPOSALS to rehabilitate the Indian soap industry, to improve its technology and export capacity and to increase the use of indigenous chemicals and oils were discussed by industrial and Government spokesmen at the recent 16th conference of the All India Soap Makers' Association in Madras.

The conference served to reveal how large has been the setback Indian soap makers have experienced since the end of wartime conditions, which had fostered new markets for the Indian soap products.

Mr. Godrej, the association's president, said that the plight of the industry could be gauged from the fact that although installed capacity was 300,000 tons, production in 1948 was 180,000 tons and, in 1949, less than 100,000 tons. The average indigenous consumption was 125,000 tons.

#### **Few Exports**

Wartime demands were inflated and the lack of soap in other countries was mainly responsible for the bumper sales during that time. But the cessation of hostilities, followed by the loss of India's rich markets after partition, contributed to the steep decline in demand. There were now no significant exports from India, the president said.

Tracing the history of the industry, Mr. Godrej said that for a long time all the soap consumed in India had been made at home and soap-making was the one industry which supplied all domestic needs and was able to export.

Although over a year had elapsed since the Government's attention was first drawn to the high cost of vegetable oils, by far the most important and indispensable raw material, it was most regrettable, he said, that the prices continued to be considerably higher than those which, for example, manufacturers in the United Kingdom paid for high-grade coconut and palm oil. Yet India was the home of many vegetable oils.

To avoid further hardship to the manufacturers and consumers, the very high duty on coconut and palm oils must be removed and ways found to check speculation in groundnut prices. Self-sufficiency in raw materials should be achieved through greater production of caustic soda and of perfumery materials.

The importance of soap exports in the country's present precarious economy

could not be overlooked. The Government should realise that it must foster and strengthen economic contracts through a study of foreign markets by experts.

The industry's aim to reduce costs could be brought about only by maintenance of a certain level of production. They were prepared to take a risk, provided the per capita consumption—only one lb. compared to 20-25 lb. in the western countries—could be raised.

Mr. P. S. Kumaraswami Raja, Chief Minister, who inaugurated the conference, suggested that efforts should be made to replace the edible oils, now being consumed on a large scale for soap-making, by non-edible oils.

The growth of the soap industry in India would create a steady demand for vegetable oils, chemicals and other ingredients, which would involve the development of many subsidiary industries. The use of non-edible oils might render the products of industry much cheaper.

It was high time, he said, that those engaged in soap manufacture took stock of the present position of the industry, and made plans for its improvement.

Mr. P. B. Kurup, chairman of the reception committee, said that the South Indian Soap Makers' Association, which had been functioning as a parallel association to the All India Soap Makers' Association, had now agreed to work with that organisation.

#### **Surplus Stocks**

The industry today, he said, was faced with the tragedy of mounting production, stock accumulation and decreasing purchasing power of the masses. Normally the surplus would have found its way to Burma, China and Indonesia, but the political ferment in those areas had virtually closed the door. Pakistan, which had been the main consumer, did not seem now to patronise Indian products. Egypt, the Sudan, Cyprus, Syria, the Lebanon and Ceylon were now fairly advanced in soap-making.

Mr. Kurup considered they had depended too long on foreign essential oils and aromatic perfumes. There were abundant facilities in India for growing all species of aromatic plants and Indian firms had already made a beginning in the manufacture of essential oils and perfumes. The industry, he said, must be nationalised.

## The Stock and Chemical Markets

**G**ENERAL undertone in British Funds and industrial shares has been firmer. Success of the new East African loan helped British Funds, and leading industrials were favoured because of attention drawn to the attractive yields and the assumption that in most cases there are excellent prospects of dividends being maintained.

Imperial Chemical have been active around 42s. 4½d., the market continuing to expect excellent results and an unchanged 10 per cent dividend total. Monsanto, however, eased further to 48s. 9d. Laporte Chemicals 5s. shares were 9s. 4½d., Albright & Wilson 28s. 6d., Amber Chemical 2s. shares were 4s. 9d., F. W. Berk 14s. 3d. and Boake Roberts 25s. 6d.

In other directions, Bowman 4s. shares were 5s. 3d. and Brotherton 10s. shares 19s. 3d. Sanitas Trust 10s. shares eased to 16s. 3d., Pest Control 5s. were 7s. 9d., W. J. Bush 5 per cent preference 22s. 3d., and L. B. Holliday 4½ per cent preference 19s. 9d. Fisons rallied to 21s. 9d. on the new issue terms.

Shares of plastics and kindred companies were uncertain, apart from British Xylonite, which changed hands around 67s. 6d. J. B. Broadley 1s. shares fell to 3s. 9d. on the passing of the dividend; Kleemann were 8s. 9d. and De La Rue 21s. 3d.

There has been further buying of United Molasses, which have risen to 40s., partly due to the market view that there are share bonus possibilities. Lever & Unilever have been steadier at 41s. 6d., but Lever N.V. eased further to 40s. 6d. There was again firmness in British Glues (20s. 3d.) because of dividend possibilities, and Amalgamated Metal shares, at 19s., remained under the influence of their increased payment. British Oxygen at 94s. 6d. have been firm, in anticipation of the financial results and helped by the prospect of an issue to shareholders on attractive terms.

Associated Cement strengthened to 77s. and, after an earlier reaction, Borax Consolidated to 52s. 6d. Turner & Newall were firm at 77s. 3d. Glaxo Laboratories, at 45s. 7½d., have been active, and Boots Drug were higher at 46s. United Glass Bottle remained at 68s. 9d., earnings being well in excess of dividend payments; there

are good prospects for shareholders. It is not generally expected, however, that there will be an increase in the distribution for the past financial year.

Iron and steels have been firmer, buyers being attracted by the good yields and by the knowledge that, even under nationalisation, there would be prospects of capital appreciation because current market prices are substantially below the "take-over" prices. Hadfields were 26s., Dorman Long 29s. 6d. and United Steel 24s. 6d. Babcock & Wilcox, at 57s. 6d., showed some profit-taking; Staveley firmed up to 75s. 6d.

Oils eased after earlier small gains. Anglo-Iranian were 75/32 and Shell 68s. 1½d.

### Market Reports

**T**HE effects of changed values of sulphuric acid, zinc and zinc oxide have represented the main factors in the industrial chemicals market during the past week. The movement to the home consuming industries is on a steady scale and the flow of export inquiry remains satisfactory. In most sections the supply is equal to the demand. The reduction recently revealed in the value of chemical exports in February are not entirely accounted for by the shorter month. Australia continues to be one of the more important overseas customers. Trade in the coal tar products is unaltered, pitch continuing in fair request for home and export. The home price is now quoted 90s. per ton ex-works for bulk quantities.

**MANCHESTER.**—Firm price conditions have been maintained on the Manchester chemical market, although there has been little actual movement of stock. There has been a steady flow of delivery specifications from the leading industrial users, representing good quantities of alkalis as well as potash and ammonia compounds. A fair volume of new business on both home and export account is reported. There is a steady call for fertilisers.

**GLASGOW.**—Business in the Scottish heavy chemical market has been consistent, and the export market is reported to have shown renewed activity.

## Law and Company News

### Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

#### Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.)

**EDWARD O'KEEFE, LTD.**, Dublin, manure manufacturers. (M., 1/4/50.) February 24, deb. securing all moneys due or to become due to the Provincial Bank of Ireland, Ltd.; general charge and a specific charge. \*£6000. December 28, 1948.

**SOLIDOL CHEMICAL, LTD.**, London, S.E. (M., 1/4/50.) March 1, £1500 (not ex.) mort., to Lloyds Bank, Ltd.; charged on Ashmead House, Disney Street, S.E.1. \*Nil. December 29, 1949.

**SOUTHERN CHEMICALS, LTD.**, Dublin. (M., 1/4/50.) February 27, deb. securing all moneys due or to become due to the Bank or Ireland; general charge and a specific charge upon property in Co. Limerick. \*£1000. March 26, 1948.

#### Creditors' Meeting

**DURALITE, LTD.**, 3 Grays Inn Place, London, W.C.1. A meeting of creditors is to be called at Winchester House, London Wall, E.C.2, on April 17.

### Company News

#### Anchor Chemical Company

Trading profit of the Anchor Chemical Co., Ltd., for the year was £84,401 (including a profit of £14,679 of an exceptional nature). Disposable balance amounted to £86,171. The directors recommended that £20,000 be placed to building and research reserve and a final dividend of 26½ per cent (£9900) paid on ordinary shares (40 per cent for the year).

#### Evans Medical Supplies, Ltd.

The Treasury's consent has been obtained to issue, on behalf of Evans Medical Supplies, Ltd., 615,682 5s. ordinary shares

at 5s. 6d. per share for subscription by ordinary stockholders. It is hoped to maintain the ordinary dividend at 10 per cent p.a. on the increased ordinary capital and to pay the usual interim dividend of 3 per cent in December, 1950.

#### London Aluminium Company

The fall in 1949 trading profits of the London Aluminium Co., Ltd., from £308,045 the previous year to £149,464, was explained by Mr. Duncan Campbell (chairman) as being due to the general rise in distribution and production costs, the increased cost of raw materials, particularly aluminium, keener competition in the home market for culinary utensils in aluminium and to the expansion of the company's heavy engineering activities.

#### Increased Capital

Notification of an increase of the capital of Trimpell, Ltd., petroleum refiners, London, E.C.3, by £499,700 (the registered capital was £300) records that shares were allotted on February 10 to Shell Refining and Marketing Co., Ltd., and to I.C.I., Ltd. The former holds 249,850 "A" shares and I.C.I. the same number of "B" shares.

### New Registrations

#### M. L. Alkan (Production), Ltd.

Private company. (479,840). Capital £7500. Objects: To take over jointly or in association with M. L. Alkan (Sales), Ltd., the business carried on by M. L. Alkan at Long Drive, Greenford, Middlesex; and to manufacture chemicals of all kinds, etc. Directors: M. L. Alkan and K. Alkan, both of 14 Courtleigh Bridge Lane, N.W.11.

#### Ellis Research & Testing Laboratories, Ltd.

Private company. (479,385). Capital £2000. To conduct research laboratories and other establishments and general, chemical, physical and other scientific investigations and analysis, etc. Directors: E. H. Ellis and M. M. Ellis. Reg. office: Ling House, Dominion Street, E.C.2.

#### Ellis Scientific Equipment, Ltd.

Private company. (479,386). Capital £8000. Manufacturers of scientific equipment and apparatus, etc. Other particulars similar to Ellis Research & Testing Laboratories, Ltd.



## ASSISTING THE PATENTEE

### Possible Extensions of Protection

SOME improvements in conditions favouring the patentee are to be noted, in addition to the main provisions of the Patents Act, 1949, which became operative on January 1. Two new conditions contribute to extend the possible fruitful life of a patent.

The period of operation of a patent—ordinarily 16 years—will be increased by the provision that it should now date from the time when the complete specification is filed, instead of from the date of application (12-15 months earlier). A "provisional specification" is required with the application and, if a question of priority should arise, the date of presenting this will be applicable to the case.

The new dating procedure will also allow deferment of payment of increased fees.

Extensions beyond the ordinary term of 16 years are obtainable if it is proved that the patentee has not been adequately rewarded by the patent or that the war has prevented the patent being properly worked. The fact that an extension has been obtained under the "war losses" provision does not preclude an extension under ordinary provision. A sole licensee can now apply for extension of a patent.

No patent has full legal sanction until it is sealed with the seal of the Patent Office and a request for this must normally be made within 21 months from the date of application. Now, even if this time has expired, the Comptroller can order a patent to be sealed, provided a request is made within six months and it is shown that the failure to apply for sealing was unintentional.

## German Patent Law

DISPOSSESSION of an enterprise in the Eastern Zone of Germany is applicable locally only insofar as patent rights are concerned; such action does not apply to the territory of the Federal German Republic or to Western Berlin.

That judgment was given recently by the County Court of West Berlin, which further stated that where a company which has been dispossessed in the Eastern Zone continues its activities in the Western zones, protection of its patent rights are maintained.

Products manufactured according to such patents by the company in the Eastern Zone must not, however, be sold, distributed, or used in the Western zones or in Western Berlin.

## TAXATION BURDEN

### NUM Demands Several Reliefs

THE National Union of Manufacturers, representing more than 5000 firms and 65 trade associations, has sent to the Chancellor of the Exchequer a memorandum calling for "heroic" measures to reduce Government expenditure, including the appointment of an independent body to overhaul Government spending, the reduction of the purchase tax to a flat rate of 33½ per cent and a consideration of the damaging effect of death duties on medium and smaller firms and family businesses.

The memorandum emphasises "that the enormous volume of Government expenditure, now absorbing something like 40 per cent of the national income, imposes a crippling burden of taxation on British industry."

The National Union says it can find no justification for the tax on undistributed profits, which can only be regarded as a tax on capital, as it results in reducing the sum that would otherwise be left for capital development. It strongly urges that it should be repealed. It is also recommended that the existing maximum allowance of £2500 as the chargeable remuneration of working directors (in cases where the directors have a controlling interest) should be increased to £5000, retaining the present overriding maximum of 15 per cent of the profits.

## Unfair Limitation of Dividends

THE need for greater incentives and rewards for the individual worker and producer were emphasised by Viscount Hinchinbrooke, M.P., at a luncheon of the Society of Individualists in London last week.

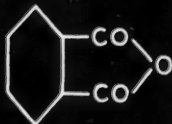
Referring to the dividend limitation, Lord Hinchinbrooke suggested a partial freeing of payments and declared that there should not be artificial limitation of the dividends of those who had the most interest in the concern.

Encouragement was owed to workpeople engaged in the business, the directors and executives who managed it, the merchant banker who nursed it and the family which founded it—in fact, all who gave a business drive and enterprise.

Lady Benn, explaining the absence (through illness) of the society's president, Sir Ernest Benn, said that he was very much better and looking forward to attending the next luncheon of the society.



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## Patent Processes in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patents Office, Southampton Buildings, London, W.C.2, at 2s. each. Higher priced photo-stat copies are generally available.

### Complete Specifications Accepted

- Preparation of 2-halo-2-formylethanes.—American Cyanamid Co. July 30 1947. 636,353.
- Aluminium magnesium alloys.—Acme Aluminium Alloys, Inc. July 31 1947. 636,414.
- Manufacture of plastic articles.—B.X. Plastics, Ltd., P. G. T. Hand, J. F. Clark, and A. E. Judd. July 19 1948. 636,233.
- Method of concentrating minerals.—Nassau Smelting & Refining Co. Aug. 7 1947. 636,356.
- Synthetic rubber-like materials.—B. F. Goodrich Co. Aug. 21 1947. 636,238.
- Adhesive compositions.—I.C.I., Ltd., and B. J. Balfe. Sept. 10 1948. 636,423.
- Process for absorbing, volatile hydrocarbons from mixed gases.—N.V. De Bataafsche Petroleum Maatschappij. Nov. 4 1947. 636,279.
- Production of synthetic lubricating oil.—Standard Oil Development Co. Nov. 5 1947. 636,372.
- Production of polymeric esters.—Courtaulds, Ltd., E. R. Wallsgrove, and F. Reeder. Nov. 30 1948. 636,429.
- Process for treating olefinic aldehydes.—N.V. De Bataafsche Petroleum Maatschappij. Dec. 16 1947. 636,430.
- Preparation of keto-carboxylic acids and their derivatives.—United States Rubber Co. Dec. 19 1947. 636,237.
- Paraffin wax composition.—Standard Oil Development Co. Jan. 19 1948. 636,435.
- Anodic oxidation of aluminium and its alloys.—Roval, Ltd., S. T. Roberts, and R. W. Taylor. Jan. 19 1949. 636,233.
- Manufacture of cyclo-alkadienes.—Standard Oil Development Co. April 29 1948. 636,303.
- Method of regenerating a duplex ion exchanger.—Sun Chemical Corporation. Nov. 5 1945. 636,240.
- Lubricating oil compositions.—E. P. Newton. (Standard Oil Co. of California). Oct. 18 1944. 636,941.
- Process of producing an aqueous dispersion for treating fibrous materials and the treatment of such materials therewith.—Monsanto Chemical Co. June 4 1946. 636,878.
- Process of and apparatus for the production of nitric acid.—H. Frischer. March 11 1947. 636,951.
- Production of combustible gases from hydrocarbon oils.—Gas Light & Co., S. Pexton, and M. Maccormac. April 14 1948. 637,108.
- Castor oil polybasic ester gels.—British Thomson-Houston Co., Ltd. April 18 1947. 637,110.
- Processes of improving the stability of an unstable solution of a reaction product of melamine, an aldehyde and a bisulphite.—Monsanto Chemical Co. April 22 1947. 636,892.
- Method of producing silica fibres and fibrous articles produced thereby.—H. I. Thompson Co. April 24 1947. 636,893.
- Phosphatic fertilisers.—A. R. Standaert, and E. H. I. Brown. May 4 1948. 636,898.
- Lustrous zinc and method for production thereof.—Poor & Co. May 28 1947. 636,954.
- Manufacture of organosilicon resins.—Dow Corning Corporation. July 3 1947. 636,905.
- Luminescent zinc fluoride and method of preparing same.—Sylvania Electric Products, Inc. July 22 1947. 637,120.
- Production of pyrazine.—American Cyanamid Co. Aug. 5 1947. 636,918.
- Process for the manufacture of phosphoric acid.—Davison Chemical Corporation. Aug. 11 1947. 636,964.
- Process for the manufacture of pyridine compounds.—Roche Products, Ltd. Sept. 20 1947. 637,130.
- Production of alkali cellulose and cellulose derivatives made therefrom.—M. H. Wilcox, J. Downing, and J. G. N. Drewitt. Oct. 15 1948. 637,133.
- Manufacture of cellulose ethers.—M. H. Wilcox, J. Downing, and J. G. N. Drewitt. Oct. 15 1948. 637,134.
- Manufacture of sulphur-bearing alcohols.—C. Arnold. (Standard Oil Development Co.). March 27 1946. 637,295.
- Manufacture of hard sintered alloys.—Soc. Le Carbone-Lorraine. July 19 1946. 637,165.
- Production of strontium peroxide.—A. Pavlik. Jan. 28 1947. 637,172.
- Manufacture of catalytic materials.—C. Arnold. (Standard Oil Development Co.). Feb. 14 1947. 637,178.
- Modified lead sulphate pigments and the process of manufacturing.—National Lead Co. March 12 1947. 637,304.
- Process for preparing mercapto vinyl derivatives.—Gevaert Photo-Producten N.V. March 21 1947. 637,182.
- Manufacture of penicillin derivatives.—Merck & Co., Inc. April 11 1947. 637,184.

Sulphur  
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## FORECAST FOR 1950

### Sulphuric Acid and Metals

THE rising trend anticipated in chemical production is shown by more than one forecast in the Government Economic Survey for 1950 (CMD 7915). Use of labour by chemical and allied trades is expected to have risen at the end of this year to 455,000 (449,000 in December last).

The expected scale of consumption of materials includes these items:—

	1948	1949	1950
	(Thousand tons)		
Sulphuric acid	1563	1677	1800
Aluminium	174	179	180
Copper	357	319	330
Tin	25	21	22
Refined lead	179	152	200
Zinc	223	199	220

### Sterling Aluminium

THE suitability of the Volta river project in the Gold Coast as a sterling area source of aluminium was raised in the House of Commons by Mr. John Grimston. Mr. J. Griffiths said that a survey of the region was in progress, covering not only the possibility of hydro-electric power but also requirements of irrigation and navigation. He would expedite the report.

## SPAIN'S METAL PROBLEMS

### Shortage of Ores and Coal

THE iron and steel industry in Spain, concentrated mainly in the Bilbao district on the Bay of Biscay coast, is facing the likelihood of the exhaustion of the higher-grade ores in the north. That is the conclusion made by the (Canadian) International Trade Relations Division and expressed in an article published in *Foreign Trade* (7, No. 164, 291-4).

There are substantial ore reserves in the south of Spain, but high transport costs make their utilisation uneconomic, the division reports. Plans to produce more steel in the Asturias, using low-grade ores, would take at least four years to become fully effective.

The production of tinplate has fallen in recent years to some 22,000 tons a year, about half the total capacity.

Aluminium consumption is about 3000 tons a year, 2000 tons of which is imported, the balance being produced in Spain from imported alumina. The new I.N.I. plant for the electrolysis of alumina in Valladolid is expected to have a capacity of 10,000 tons a year. The manufacture of alumina itself from imported bauxite is also planned.

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## SITUATIONS VACANT

### WANTED SALT COMMISSIONER, CEYLON

APPLICATIONS are invited for the post of **SALT COMMISSIONER** in the Salt Division of the Department of Industries, Ceylon, on the salary scale Rs13,800-Rs600-Rs15,600 per annum, for Ceylonese, Indians and Pakistanis, and £900-£50-£1,200 per annum for Europeans, Americans and Australians.

Further particulars may be obtained from the High Commissioner for Ceylon in London, 25, Grosvenor Square, W.1.

Applications for the above post should reach the High Commissioner for Ceylon in London, on or before April 22nd, 1950.

**CHEMICAL ENGINEERS** required for Bahrain Petroleum Company Limited. Applicants must possess a degree in Chemical Engineering, or have obtained at least a Graduate Membership of the Institution. Experience in petroleum refinery work desirable, but experience with coal tar or other heavy industrial processes acceptable. Married applicants must be prepared to accept a two years separation from family. Free board, air conditioned accommodation and medical attention provided with provident fund benefits. Kit allowance. Agreement periods 24 to 30 months with paid home leaves. Commencing salary according experience with minimum £660 p.a. for recent University Graduates. Write with full particulars, age qualifications experience etc., to Box 3555 c/o CHARLES BARKER & SONS LTD., 31, Budge Row, London, E.C.4.

## SITUATIONS VACANT

**ASSISTANT CHEMIST** required for work in the Process Development Department of a Firm in the Manchester area engaged in the Manufacture of Organic Chemicals. Should have Degree or equivalent, together with some experience in industry. A knowledge of Chemical Engineering would be an added qualification, but is not essential. The vacancy should appeal to young Graduates who wish to gain experience in a wide and expanding field of the Chemical Industry. Salary is commensurate with age and experience, and applications should be forwarded to Box No. C.A. 2906, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

**MECHANICAL AND CHEMICAL ENGINEERS** are required for the design of Chemical Plant and specialised items of equipment. Preference will be given to applicants of Degree standard who have some industrial or design experience. The openings offer scope and opportunity to young engineers willing to take responsibilities. Write to **HEAD WEIGHTSON PROCESSES, LTD., 24/26, Baltic Street, London, E.C.1.**

**THE CIVIL SERVICE COMMISSIONERS** invite applications for a post of **RADIOCHEMICAL INSPECTOR** on the staff of the Ministry of Health. Candidates must be at least 30 on the 1st January, 1950, and must have a good Honours Degree in Chemistry and substantial research experience. A good knowledge of the properties and chemistry of radio-active substances is essential and familiarity with techniques of estimating traces of radio-active elements desirable. The successful candidate will be required to carry out such estimations and to give advice on matters relating to the control and disposal of radio-active waste products.

Inclusive London salary, £1,050-£1,270 (men), £900-£1,100 (women).

The successful candidate will be stationed in London but will be required to visit other parts of the country.

Further particulars and forms of application from the **SECRETARY, Civil Service Commission, Scientific Branch, 7th Floor, Trinidad House, Old Burlington Street, London, W.1,** quoting No. 3018. Completed application forms must be returned by 27th April, 1950. 6198/250/DVL.

## FOR SALE

**ONE** 150-litre working capacity water bath-heated **ENAMELLED VESSEL** mounted in mild steel water bath, fitted with cooling coil and provision for electric heater; bolted-on dish cover having sight and light glasses, 3 by 2 in. branches, 1 by 3 in. branch, charge-hole and 6 in. bore distillation bend; no stirrer.

**TWO** 100-litre working capacity **OPEN-TOP ENAMELLED VESSELS**, steam jacketed for about 5 lb. per sq. in. working pressure; mounted on legs. The enamelling in one vessel is sound, but there is a hair-line crack in the top of the second.

**ONE MILD STEEL TOTALLY ENCLOSED VESSEL**, 200 litres capacity steam jacketed for 50 lb. working pressure, 1½ in. bottom outlet; cover fitted light and sight glasses, 8 in. diameter charge-hole, 3 by 1½ in. branches, no stirrer but centre branch suitable for glanding and fitting agitator.

**UNUSED WAX EXTRACTION PLANT** by Fraser & Fraser, Limited, designed for Lignite. 36 tons per 24 hours. Full specification on request.

**Large Activated Carbon SOLVENT RECOVERY PLANT** by Sutcliffe & Speakman.

**REED BROTHERS (ENGINEERING) LIMITED,**  
Replant Works, Cuba Street,  
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## FOR SALE

## 600

## PROCESS PLANT

**VERTICAL open top JACKETED MIXER** by L. A. MITCHELL, tin sprayed internally, approx. 7 ft. diam. total depth 8 ft. 6 in. Agitator consists of central shaft suspended from top with 3 blades. Motorised 380/350, 950 r.p.m.

**Vertical open top steam JACKETED MIXER** by BRINJES & GOODWIN, approx. 2 ft. 9 in. diam. by 2 ft. 6 in. deep, mounted on 4 tee iron legs. Overdriven paddle agitator driven through crown wheel and pinion. 2-in. bottom outlet.

**HORIZONTAL MIXER or SALVA CONCENTRATOR**, approx. 2 ft. 6 in. diam. by 4 ft. long with horizontal agitator shaft arranged for hand op. through gearing. Mixer body fitted with manhole 15 in. by 12 in. and steam jacketed for 40 lb. W.P. Mounted on strong steel framework with hand lever tilting.

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No. 201 **ONE** **DITTO**.

No. 202 **ONE** **DITTO**.

No. 203 **ONE** **DITTO**.

No. 204 **ONE** **WERNER PFLEIDERER MIXER OR INCORPORATOR**, similar to the above, with a C.I. built pan 25 in. by 25 in. by 19 in. deep, belt pulleys 26 in. diam. by 5 in. face, double fin-type agitators, and mounted on C.I. legs.

No. 205 **ONE** larger **WERNER-TYPE MIXER OR INCORPORATOR**, by Dobson & Barlow, with C.I. built pan or mixing chamber, of the double "U" type, 4 ft. 6 in. by 3 ft. 7 in. by 3 ft. 10 in. deep, with a jacketed bottom and slides to within about 12 in. of top, and fitted with double "Z" type agitators, counterbalancing cover, machine-cut gears at each side, steel back-frame with counterbalancing weights and self-contained belt-driven tipping gear and main triple fast and loose belt pulleys 30 in. diam. by 6 in. face, with belt fork. Approximate overall sizes, 12 ft. long by 8 ft. wide by 10 ft. high.

No. 206 **ONE** **DITTO** of the same pattern, by **DOBSON & BARLOW**

No. 207 **ONE** **DITTO** of the same pattern by **DOBSON & BARLOW**

No. 208 **ONE** **DITTO** by **WERNER PFLEIDERER**, with a C.I. built pan or mixing chamber, of the double "U" type, 4 ft. 5 in. long by 3 ft. 8 in. by 33 in. deep, with double "Z" mixing arms, gears at each end, hand-operated tilting gear, with steel backframe, counterbalancing weights and chains, and fast and loose pulleys 3 ft. diam. by 6 in. face.

No. 209 **ONE** **HORIZONTAL "U"-SHAPED MIXER**, steel built, riveted, measuring about 8 ft. 3 in. long by 3 ft. wide by 3 ft. 3 in. deep, with horizontal shaft, fitted with bolted-on mixing arms about 18 in. long by 4 in. wide, with intermediate breakers, and driven at one end by a pair of spur gears, with countershaft, fast and loose belt pulleys, outer bearing and plug cock type outlet at the opposite end, mounted on two cradles fitted to two R.S.J. running from end to end.

No. 210 **ONE** **HORIZONTAL MIXER** as above.

No. 211 **ONE** **HORIZONTAL MIXER** as above.

No. 212 **ONE** **HORIZONTAL MIXER** as above.

No. 213 **ONE** **HORIZONTAL MIXER** as above.

No. 214 **ONE** **HORIZONTAL MIXER** as above.

These six "U"-shaped mixers are in some cases fitted with steel plate covers and a steam jacket round the bottom and extending to within about 18 in. of the top with plain end plates.

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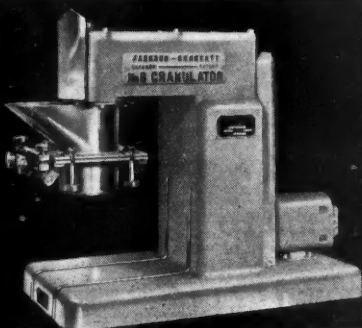
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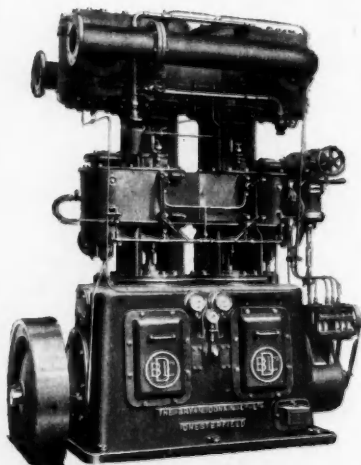
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